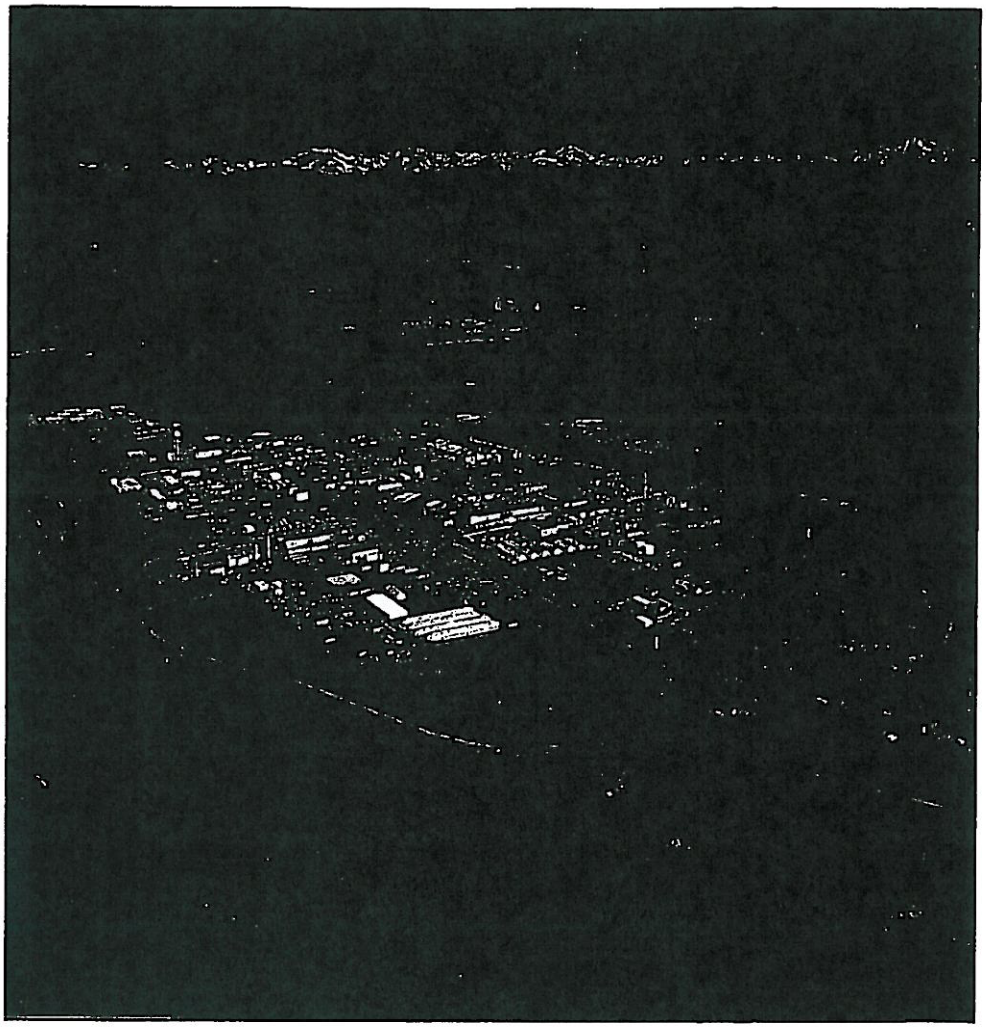
NOTICE

All drawings located at the end of the document.



RECONNAISSANCE-LEVEL CHARACTERIZATION REPORT FOR TRAILER T112A AND TRAILER T112C

Revision 1

Reviewed for Classification/UCNI /OUO
By: Janet Nesheim, Derivative Classifier
DOE, EMCBC
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September 30, 1999

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RECONNAISSANCE-LEVEL CHARACTERIZATION REPORT FOR TRAILER T112A AND TRAILER T112C

Revision 1

September 30, 1999

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
ASD	Analytical Services Division
Be	Beryllium
CBDPP	Chronic Beryllium Disease Prevention Program
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
LSDW	Life safety disaster warning
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
Pb	Lead
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated biphenyls
PDS	Pre-Demolition Survey
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
SVOCs	Semi-volatile organic compounds
TRU	Transuranic
TSCA	Toxic Substances Control Act
TSO	Transportation Security Office
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to free-release trailer 112C and dispose of trailer 112A as waste. This RLC implements the Pre-Demolition (final status) survey design based upon the Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575). Physical, chemical and radiological hazards were assessed based on historical reviews, process knowledge (Appendix 1), and newly acquired RLC data (Appendices 2-4). Results indicate no radioactive or chemical contamination exists and no significant physical hazards are present. Trailer 112A contains asbestos as part of the floor tile, which is considered an integral part of the structure. Based on the assessment, the trailers are confirmed to be Type I facilities and can either be free-released to commerce (i.e., for sale and re-use), or disposed of as waste.

1.0 INTRODUCTION

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous buildings and structures will be removed. Among these are the trailers T112A and T112C, which are currently located in the Property Use and Disposition Yard near Building 280. These trailers no longer support the RFETS mission, and need to be removed to reduce Site infrastructure, risks and operating costs.

Before the trailers can be released, hazards must first be identified. Hazards identified will be used to plan final disposition. This document presents the existing physical, radiological and chemical hazards associated with the two trailers, and classifies the facilities pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1998a). The hazards assessment is based on facility/process knowledge, operating and spill records, historical radiological and chemical data, and results of the RLC conducted. The RLC was conducted pursuant to the RFETS Decontamination and Decommissioning Characterization Protocol (DDCP). The content and outline of this report are consistent with the Kaiser-Hill (K-H) Facility Disposition Program Manual (FDPM, K-H, 1998b).

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. The purpose includes both summarizing the data into concise, usable formats and interpreting the data for use in management decisions, primarily:

- Definition of individual hazards and overall risk associated with facility D&D;
- Typing of trailers based on hazards identified; and
- Ability to either free-release the trailers from the site, or dispose of them as waste.

1.2 Scope

This report covers physical, radiological and chemical characterization of T112A and T112C. Chemical characterization was conducted using Colorado Hazardous Waste Management regulations as a means to segregate materials as either hazardous or non-hazardous waste. Based on the hazards identified, the trailers were typed and assessed against free-release criteria.

2.0 OPERATING HISTORY AND PHYSICAL DESCRIPTION

2.1 Trailer 112A

This trailer was constructed/assembled at Central Avenue and Fourth Street, behind the northwest corner of Building 112, in the early1960s. The size of this trailer is approximately 45' X 60' X 10', and it is assembled from 5 trailer units of approximately 12' X 45' feet in size. There are four doors leading into this trailer. The siding is enamel on aluminum. Structurally the trailer is sound; there are no leaks in the ceiling, and the outside is not damaged. The interior "outside" walls are wood paneling over insulation, the interior partition wall is wood paneling on stud framing, and the floor is carpet and sheet vinyl/linoleum on wood. The ceiling is a drop type with acoustical tile panels. The trailer has men and women restroom facilities. The men's restroom has a hot water heater for the facility. The trailer also has five electric heat pumps for heating and air conditioning. T-112A has a smoke detection system and was connected to the Plant fire alarm and life safety and disaster warning (LSDW) systems. No other equipment remains in the trailer.

On July 21, 1999, the trailer was separated into five separate units and transported to the site Property Utilization and Disposition yard near Bldg. 280. The units were positioned in their original configuration, with approximately 6 inches of separation between units. Some debris was removed.

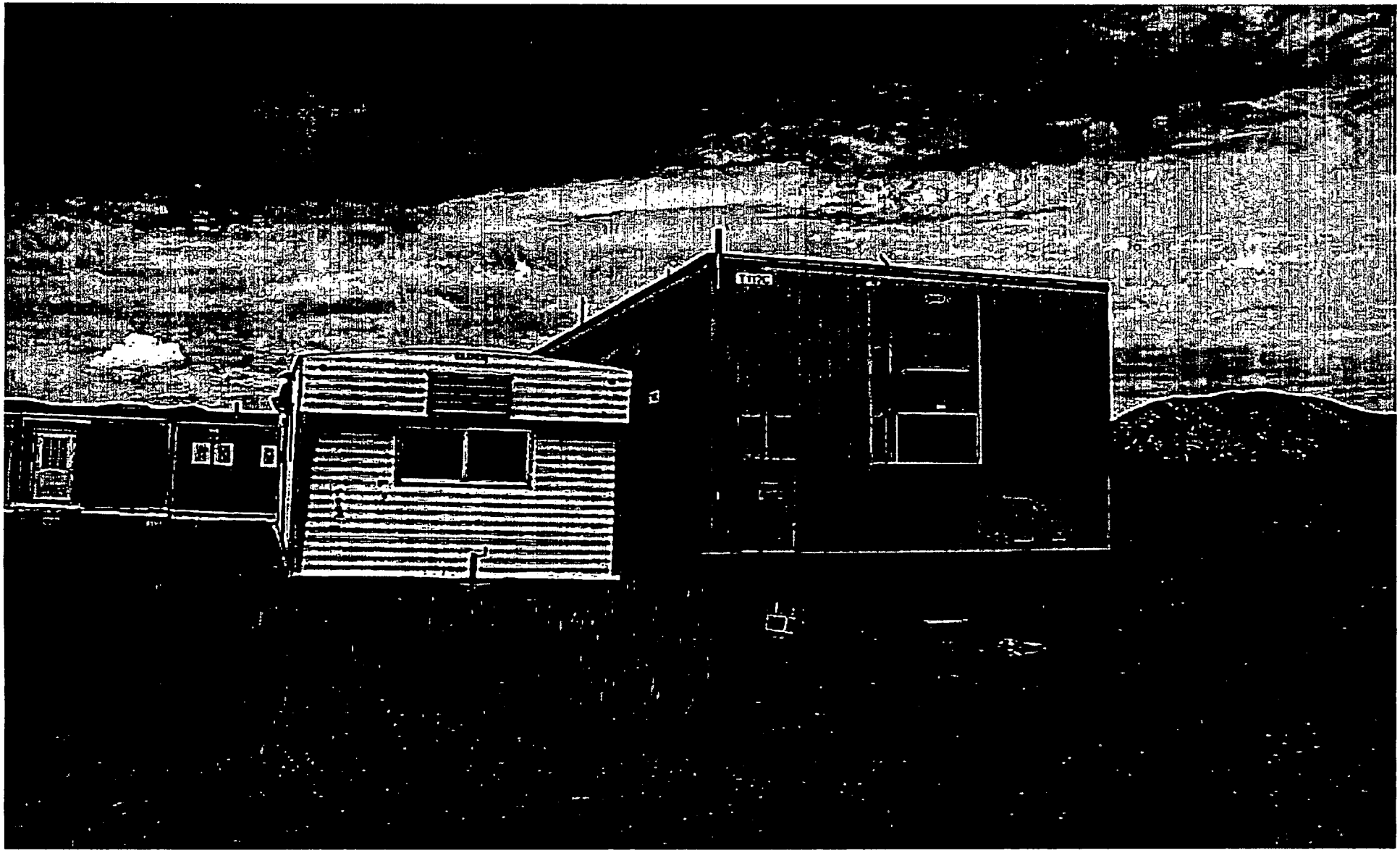
Prior to the Radio and Page Operations moving into T-112A, the south half of the trailer was used as a telecommunications office. The RFETS Traffic Department originally occupied the north section of T-112A. The south half of T-112A was a Company Store when the RFETS was managed and operated by Rockwell International (from approximately 1975 to 1990). Later the north section of T-112A was used by RFETS Transportation Security Office (TSO) Scheduling. Both the telecommunications and TSO groups vacated this trailer in March 1999. The trailer has remained unoccupied.

2.2 Trailer 112C

This trailer was brought onsite and placed at Central Avenue and Fourth Street in 1991. The size of this trailer is 14' - 0" X 60' - 3" X 13 ' - 10" at the roof edge. There are two doors leading into this trailer. The siding is enamel baked on aluminum. Structurally the outside has a panel that has been torn loose and part of it has blown away; inside, the condition is good. The interior "outside" walls are vinyl over 4' x 8' dry wall over insulation, the interior "partition" walls are the same materials on stud framing. The ceiling is a drop type with 2' x 4' acoustical tile panels and the floor is carpet over wood flooring. The trailer has an electric heat pump for heating and cooling and a fire sprinkler system, and it was connected to the Plant fire alarm and LSDW systems.

This trailer has been used as office space since it has been on site. There are six hard-walled rooms, of which five are offices. The sixth contains the telecommunication equipment and the fire sprinkler controls. The last occupant was Wackenhut Services which, used it as a scheduling office. They moved out in 1998. The trailer was moved to the site Property Utilization and Disposition Yard near Bldg. 280 on July 21, 1999. The trailer has remained unoccupied. Refer to Exhibit 2-1 for an exterior photograph of the trailers.

Exhibit 2-1 Exterior Photograph



3.0 SUMMARY OF CHARACTERIZATION ACTIVITIES

An RLC was designed to demonstrate that DOE-added radioactive materials are not present or have been removed from RFETS facilities to the extent that residual levels of contamination are below the Derived Concentration Guideline Levels (DCGLs) and that the trailers can either be free-released or disposed of as waste. This section of the RLC Report (RLCR) presents DQOs used, historical data, and additional RLC data needed to release the trailers. The section also describes the survey area and survey unit for the trailers, and defines the methods that were implemented in collecting radiological surveys, scans and samples. The survey followed the guidance provided in NUREG-1575, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

3.1 Data Quality Objectives

The following section outlines the DQO process used in designing the RLC Package.

The Problem

The problem involves quantifying the amount of material, media, equipment, floors, walls and ceilings, interior/exterior to the buildings and determining the extent of radiological and non-radiological contamination so that remaining floors, walls and ceilings can be free-released (i.e., no chemical and radiological hazards remain).

The Decision

The decision is verification that free-release and waste management standards have been met.

Inputs to the Decision

The input to the decision includes data from preceding characterizations, including historical data and process knowledge; data collected from this pre-demolition survey; and applicable action levels, free-release criteria, transportation requirements, waste management regulations, pollution prevention/waste minimization criteria, and waste acceptance criteria.

Decision Boundaries

The decision boundaries include the floors, walls, ceilings, roof and fixed equipment located in T112A and T112C.

Decision Rules

This section develops the rules to support the decisions regarding characterization data.

Radionuclides

- If process knowledge/history supports the premise that no radioactive contamination is present, and a pre-demolition survey has been performed and approved, the related area and/or volume is considered sanitary waste or may be free-released.

- If all radiological survey measurements are below the surface contamination thresholds provided in DOE Order 5400.5 (Radiation Protection of the Public and Environment) and/or are within background concentrations for volume contamination material (refer to Radiological Safety Practices 09.03, "Unrestricted Release of Build or Volume Material"), the related area or volume of material is considered sanitary waste or may be free-released.

- If all radiological sample measurements are below the volume contamination thresholds provided in the No-Rad-Added Verification (NRA) Program, the related volume of material is considered sanitary waste or may be free-released.

- If any radiological sample measurement exceeds the volume contamination threshold provided in the NRA Program, the associated volume must be remediated or disposed of as radiological or mixed waste.

- If any radiological survey measurement exceeds the surface contamination thresholds provided in the RFETS Radiological Control Manual, the associated surface area must remediated or disposed of as radiological or mixed waste.

- If any radiological sample measurement (or disposal unit volume) exceeds 100 nanocuries per gram of transuranic material, the associated volume must be disposed of as transuranic (TRU) waste.

RCRA Constituents

If the waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, then the waste is considered RCRA-regulated hazardous waste in accordance with 6 CCR 1007-3, Part 261. If the waste is free from listed hazardous waste, and does not exhibit a characteristic of a hazardous waste, the waste is considered non-hazardous.

CERCLA Hazardous Substances

If the waste contains a listed hazardous substance above the CERCLA reportable quantity (40 CFR 302.40), notify the receiving disposal facility of the hazardous substance and estimated quantity prior to shipment.

Beryllium

If detectable beryllium contamination can be shown through process knowledge to consist of beryllium powder (P015 under RCRA), then the contaminated materials will be treated as RCRA waste and subject to treatment standards under 40 CFR 268.40.

If concentrations of beryllium are equal to or greater than 0.2 ug/100 cm^2, the material is considered beryllium contaminated per the Occupational Safety and Industrial Hygiene Program Manual, Chapter 28, Chronic Beryllium Disease Prevention Program (CBDPP). If the concentrations are below 0.2 ug/100 cm^2, the material is considered non-beryllium contaminated.

Polychlorinated Biphenyls (PCBs)

- If material meets the definition of "Bulk Product Waste," it may be disposed of as Toxic Substances Control Act (TSCA) waste at a permitted solid waste disposal facility without further characterization (Federal Register, Vol. 63, No. 124, June 29, 1998,40 CFR §761.62,). If the disposal facility does not possess a commercial PCB storage or disposal approval, the generator must provide written notification to the facility in accordance with §762.62.

- If material meeting the definition of Bulk Product Waste is to be free-released (e.g., recycled), the 95% upper confidence limit of the mean value of a representative sample set cannot exceed 50 ppm. This determination can be made through process knowledge or laboratory analysis.

- If material meets the definition of PCB remediation waste (i.e., potentially containing PCBs form historical releases; §761.61), the free-release concentration is ≤1 ppm PCBs, as determined in accordance with requirements of §761.61, Subpart G. Higher release levels for PCB remediation wastes are permissible, but carry specific restrictions on disposition of the material.

Asbestos

In accordance with 40 CFR 763 and 5 CCR 1001-10, if any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., >1% by volume), then material is considered Asbestos Containing Material (ACM); otherwise the material is considered non-ACM.

Tolerable Limits on Decision Error

The maximum value for false positive and false negative errors is 5% when calculating the number of samples required.

Optimization of Plan Design

Radiological characterization was conducted on interior floors, walls and ceilings, and exterior walls and roofs as necessary. The following criteria were used to develop the radiological survey/sampling characterization package:

- Radiological field measurement methods and instrumentation are described in Section 6 of MARSSIM.
- Radiological sampling and preparation for laboratory measurements are described in Section 7 of MARSSIM.
- For materials, media, equipment, floors, walls, and ceilings being released as low level and/or TRU waste, radiological surveys/samples are taken per Site Procedure 1-PRO-079-WGI-001, Waste Characterization, Generation and Packaging.
- If radiological survey/samples are required for materials, media and equipment for release as non-radioactive waste, then radiological surveying and sampling are conducted per the requirement in the RFETS HSP 18.10, Radioactive Material Transfer and Unrestricted Release of Property and Waste.
- If RCRA, TSCA or asbestos surveys/samples are required for materials, media, equipment, floors, walls and ceilings, Sampling and Analysis Plans are required per Section 6.0 of the D&D Characterization Protocol.

3.2 Radiological Characterization

Radiological characterization was performed to understand the nature and extent of radioactive materials that may be present in Trailers 112A and 112C. This section reviews the historical radiological data on these Trailers and discusses the RLC conducted. Radiological hazards and RLC data are discussed in Section 4.2, and RLC radiological data are presented in Appendices 2-4.

3.2.1 Summary of Historical Data

Historically, radiological surveys for T112A and T112C may have been performed, but the data are not readily available. There are no Plant Action Tracking System items outstanding on these trailers, which indicates no associated radiological program deficiencies. Trailers T112A and T112C are individually listed in I-P73-HSP-18.10, *Radioactive Material Transfer And Unrestricted Release Of Property And Waste, Appendix 4, Unrestricted Release Building/Facility List.* This listing authorizes the unrestricted release of administrative, non-hazardous property located in the trailers without radiological surveys or Radiological Safety signature for off-site shipment or transfer to PU&D, and is indicative of structures with a low probability of radioactive contamination. These assumptions do not directly apply to the trailer structures themselves, but does illustrate an area with a very low probability for radioactive contamination.

3.2.2 Summary of RLC Data Collected

Although historical review indicates no use of DOE radioactive material, insufficient quantitative radiological data exist to designate Trailers T112A and T112C as non-impacted pursuant to MARSSIM. Therefore, radiological surveys and scans were performed, and radioactive samples were taken and analyzed. Direct radiological surveys and scans were performed on the interior and exterior of both trailers for removable and total, alpha and beta contamination. Four radiological samples were taken from the roof of T112 A. The interior of T112A was designated as Survey Unit A, the exterior of T112A was designated as Survey Unit D, and the interior and exterior of T112C was designated as Survey Unit C.

3.2.3 Sampling and Field Measurement Methods, Procedures and Equipment

Total alpha and beta survey measurements were taken with the NE Electra using a DP-6 probe, and removable alpha and beta measurements were taken with the Eberline SAC-4 and BC-4, respectively. Radiological scans for total alpha and beta were taken with the NE Electra at a scan rate of 1.5 inches per second. Samples were screened on-site for alpha activity with the AP-2 and sent off-site for radiochemical analysis (alpha spectrometry). Radiological surveys, scans and samples were taken per the requirements of the *RFETS Radiological and Non-Radiological Trailer 112A-C Characterization Package, Revision 0* dated August, 1999 (refer to Appendix 5). All radiological samples were taken in accordance with Analytical Services Division (ASD) requirements.

A total of 64 measurements were taken within each survey unit. Each measurement and duplicate location was measured for total alpha, total beta, removable alpha, and removable beta). Twenty duplicate measurements were taken as well. The number of total surface and removable alpha measurements for floors, walls, ceilings, roofs, and fixed equipment were calculated based on MARSSIM statistical calculations. In addition, alpha scans of 10% of the total survey unit surface area were performed at biased (judgmental) locations on accessible surfaces. The scans were biased relative to those locations with the greatest potential for radioactive contamination based upon routine use of the trailer (i.e., "foot traffic"), and potential for exterior contamination (i.e., airborne fallout). The scan data were recorded as selected maximum values over the entire scan area of interest for the survey unit.

The appropriate number of survey points was calculated, and specific survey locations were selected using a random number generator. The actual measurements were taken at each grid intersection. If grid intersections (nodes) were inaccessible, the measurement was obtained as close as possible to the grid intersection, and the new location was annotated on the survey map.

Measurement locations were clearly identified by labels to provide a method of referencing survey results to survey measurement locations. These measurement locations were incorporated into a grid map at survey densities of 1 meter square.

Numerical results of this activity as well as statistical data analyses are detailed in the Appendices for each survey unit.

3.2.4 Laboratory Analysis

Radiological samples were analyzed per the requirements of the Final Sampling and Analysis Plan for Roofing Material from Trailers 112A and 112B for isotopic analysis dated July 21, 1999 (refer to Appendix 6). All radiological samples were analyzed in accordance with APO requirements.

Samples were managed to ensure an accurate record of sample collection, transport, analysis, and disposal. This management ensures that samples are neither lost nor tampered with and that the samples analyzed are traceable to a specific location in the field. Chain-of-custody documentation captures this process for all samples submitted for laboratory analysis. The chain-of-custody forms are included as part of survey documentation in Appendix 3 (Survey Unit D).

All samples collected for RFETS laboratories or approved contracted laboratories were analyzed via a Site-approved method. Individuals trained to use appropriate equipment and procedures performed the analyses. The laboratories selected have sufficient analytical capabilities for the radionuclides of interest (plutonium, americium, and uranium) and an established quality assurance/quality control program that assures the validity of the analytical results. The laboratory analytical methods used are capable of measuring levels at or below 50% of the established release criteria. All results state the detection limit for the analysis. Results are detailed in the Appendices for each individual survey unit.

3.3 Chemical Characterization

Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present in Trailers 112A and C. Characterization was based on a review of historical and process knowledge and is presented in this section. Related hazards are discussed in Section 4.3.

3.3.1 Summary of Historical Data

Information on contaminants of concern (i.e., asbestos, beryllium, RCRA constituents, lead in paint, and PCBs) is presented below.

Asbestos: Historical asbestos inspection data exist for T112A. Thirteen samples of floor tiles, wall, and ceiling material were taken in T112A, and of these, four floor tile samples were determined to be asbestos-containing.

T112C underwent asbestos inspection in 1994, and nine samples of resin, paint, and plaster were taken. None were found to be asbestos-containing.

Beryllium: There is no record of beryllium operations or storage being conducted in the two trailers (*D&D Facility Characterization Interview Checklist, Facility Checklist, HRR Manager's Report,* and *List of Known Beryllium Areas*).

The CBDPP conducted an independent beryllium survey of T112A, which confirmed the absence of detectable beryllium contamination. Beryllium smears were collected at five locations in T112A. All results were below the detection limit of 0.1 µg/100 cm^2. The action level for beryllium surface contamination is 0.2 µg/100 cm^2. In light of the known history of the trailers, the CBDPP assumes that these results were representative of both trailers. No additional sampling for beryllium was conducted.

RCRA/CERCLA Constituents (including metals and VOCs/SVOCs): According to historical and process knowledge, no chemicals were used or stored in any of the two trailers (*D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report*). Therefore, sampling for chemical contaminants is unnecessary and was not conducted.

Lead in paint: Paint on the interior and exterior surfaces of the trailers and wooden stairs and platforms was not characterized for Pb in paint. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based Paint Debris Disposal*, has directed that LBP debris generated outside of high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream. Therefore, analysis for lead in paint was not required.

Polychlorinated Biphenyls: A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T112A, and is labelled "No PCBs." There is no record of PCB product use or storage in either of the trailers (*D&D Facility Characterization Interview Checklist, Facility Checklist: and HRR Manager's Report*). Therefore, analysis for PCBs within the trailers is unnecessary and was not conducted.

Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposition are met.

The exterior surfaces of the trailers are painted tan. The interior surfaces of each trailer are covered with paneling. Historical data and process knowledge give no reason to suspect that any specialized paints or coatings associated with PCBs were applied to the trailers. Therefore, the trailers were not characterized for PCBs in paint.

Fluorescent light ballasts were inspected by a site electrician. Several PCB-containing ballasts were discovered in T112A, two of which showed evidence of minor internal

leakage within the lighting unit, above the faceplate. None were discovered in T112C. All PCB-containing ballasts were removed. No further characterization was required.

3.3.2 Summary of RLC Data Collected

An asbestos inspection was conducted by a CDPHE-certified asbestos inspector. A single sample of roofing material was collected from Trailer 112A. Visual inspections of the trailers' roofs, interior and exterior panels, walls, and floors revealed no evidence of chemical spills or releases (i.e., stains, discoloration, odors, or other physical characteristics). Based on historical information presented in Section 3.3.1 and the inspections conducted, the only additional RLC data required was the sample collected for asbestos analysis from Trailer 112A.

4.0 HAZARDS

4.1 Physical Hazards

Current physical hazards associated with the Trailers T112 A and T112C consist of those common to standard industrial environments. The trailers are not connected to any utilities, such as electricity and gas. Physical hazards are controlled by the Site Safety and Industrial Hygiene Program, which is based on OSHA regulations and standard industry practices.

4.2 Radiological Hazards

Based on historical knowledge and the RLC, Trailers T112A and T112C are classified as MARSSIM Unimpacted Class 3 (i.e., Type I pursuant to the DPP). These trailers do not contain radiological contamination above the free-release limits prescribed in DOE Order 5400.5 and the RFETS Radiological Control Manual. Survey results were below DCGLs (refer to Table 4-1), as were all scans. The two T112A roof samples were also below the total and removable alpha DCGLs (refer to Table 4-2). RLC data are presented in Appendices 2-4, by survey unit, for removable alpha, removable beta, total alpha and total beta, each in separate tables. Appendix 2 presents data for Survey Unit A, which includes the interior of T112 A. Appendix 3 presents data for Survey Unit D, which includes the exterior of T112 A. Appendix 4 presents data for Survey Unit C, which includes the interior and exterior of T112 C.

4.3 Chemical Hazards

For each trailer, the potential for a hazard due to each of the following contaminants was considered:

- Asbestos.
- Beryllium;
- Lead and other metals;
- VOCs/SVOCs;
- PCBs.

The need for analysis of each potential hazard was evaluated based upon historical and process knowledge, given that the trailers were used exclusively for administrative purposes. The chemical hazards are summarized in Table 4-3.

4.3.1 Asbestos

Historical asbestos data indicated that four floor tile samples in T112A contain asbestos. The inspection conducted as part of RLC also determined that the flooring cement contains ACM.

Additionally, a sample of roofing material consisting of gray plaster was taken at the junction of two trailer units. This material was presumably used to seal the trailer units

together at their junctions, and contained a brown resinous material as well as some of the silver/black paint which covered the roof. This sample contained chrysotile asbestos in both the plaster and paint layers. However, all of the asbestos-containing material in the trailer was non-friable and therefore does not constitute a hazard.

Historical asbestos data indicate that no asbestos is present in T112C (refer to Section 3.3.1).

Table 4-1 Summary of Radiological Survey Data

		Removable Contamination[1]				Total Contamination[1]			
		Alpha (dpm/100 cm^2)		Beta (dpm/100 cm^2)		Alpha (dpm/100 cm^2)		Beta (dpm/100 cm^2)	
	DCGL[1]	20		1000		100		5000	
	Survey Points	Min.	Max	Min.	Max.	Min.	Max	Min.	Max
T112A Interior Survey Unit A	16	0.0	3.0	-44.0	28.0	-14.0	5.0	-845.0	-277.0
T112A Exterior Survey Unit D	16	0.0	10.6	-60.0	44.0	10.0	90.0	-256.0	336.0
T112C Interior and Exterior Survey Unit C	16	0.0	4.5	-40.0	40.0	4.0	94.0	-364.0	281.0

Table 4-2 Radiological Sample Results for T112A Roof

ROOF CENTER

ISOTOPE	Reported Activity (pCi/g)	MDA (pCi/g)	Converted Activity (dpm/100cm^2)	Converted MDA (dpm/100cm^2)	DCGL[1] (dpm/100cm^2)
U-233/234	0.264	0.034	6.8	0.9	1000
U-235	0.016	0.042	0.4	1.1	1000
U-238	0.270	0.050	7.0	1.3	1000
Pu-239/240	0.000	0.045	0.0	1.2	20
Am-241	0.000	0.086	0.0	2.2	20

SW CORNER

ISOTOPE	Reported Activity (pCi/g)	MDA (pCi/g)	Converted Activity (dpm/100cm^2)	Converted MDA (dpm/100cm^2)	DCGL[1] (dpm/100cm^2)
U-233/234	0.259	0.072	6.0	1.7	1000
U-235	0.000	0.043	0.0	1.0	1000
U-238	0.332	0.035	7.7	0.8	1000
Pu-239/240	0.017	0.045	0.4	1.0	20
Am-241	0.000	0.053	0.0	1.2	20

[1] DCGL – Derived Concentration Guideline Level

4.3.2 Metals (including beryllium and lead in paint)

According to historical and process knowledge, no metals, including beryllium and lead, were used or stored in the two trailers, and therefore, no related hazards are present.

4.3.3 VOCs/SVOCs

According to historical and process knowledge, no chemicals were used or stored in either of the trailers, and therefore, no related hazards are present.

4.3.4 PCBs

All PCB-containing ballasts have been removed. There is no record of PCB product use or storage in any of the trailers, and therefore, no related hazards are present.

Table 4-3 Summary of T112A and T112C Chemical Hazards

Contaminant of Concern	Analysis	Historical or RLC?	Below release limit or regulatory thresholds?
Asbestos	Four floor tile samples in T112A were determined to contain asbestos in the mastic.	Historical	Yes[1].
	Cove base cement in T112A was assumed asbestos-containing.	RLC	
	A sample of T112A roofing material contained asbestos.	RLC	
	No asbestos was detected in T112C.	Historical	
Beryllium	Surface smears in T112A (considered representative of T112A and T112C due to trailers being used solely for administration).	Historical	Yes.
VOCs/SVOCs	No history of use or storage. No characterization was required.	Historical	Yes.
Lead in paint	No characterization has been performed.	Historical	Yes[2].
PCBs	All PCB ballasts have been removed, including two in T112A which were potentially leaking inside the face plate.	Historical	Yes[3].
	No specialized paints or coatings were observed. No characterization for PCB in paint was performed.		

1 Notification of the State and of the waste disposal facility of the presence of non-friable asbestos is required.

2 Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based Paint Debris Disposal*, has directed that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream.

3 **Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposal are met.**

5.0 DATA QUALITY ASSESSMENT (DQA)

Data used in making disposition decisions must be of adequate quality. Adequate data quality for decision-making is required by applicable RMRS and K-H corporate policies (RMRS, 1998, §6.4 and K-H, 1997, §7.1.4 and 7.2.2), as well as by the customer (DOE, RFFO; Order O 414.1, Quality Assurance, §4.b.(2)(b)). Regulators and the public also expect decisions and data that are technically and legally defensible. Verification and validation of the data ensure that data used in decisions resulting from the RLC are usable and defensible.

The DQA consists of revisiting the DQOs used and determining whether those objectives were met. This data evaluation also consisted of verifying and validating the RLC data, which ensures that data input into decisions are accurate, precise, representative, complete, and comparable. Because only radiological data were collected for the project (i.e., no chemical surveys or samples were required), the DQA addresses only radiological survey and sample results.

Many of the DOE quality elements of Order 414.1 are inherent within the MARSSIM guidance, as DOE was a co-author of MARSSIM. The RLC for trailers 112A and 112C was conducted in accordance with the FDPM and the DDCP. These programs exist within the Site's DOE approved QA Program which accommodate applicable sections of NQA-1. Adequate implementation of the quality elements required by DOE Quality Assurance Order (414.1) was corroborated through the verification and validation process described within this section.

Original DQOs of the project are stated in §3.0. Problems, decisions, decision inputs, project boundaries, and error tolerances were adequately defined. Original estimates of sample types, quantities, and gridding locations/densities were confirmed by using statistics (vs. assumed values) derived from the actual data collected for the project.

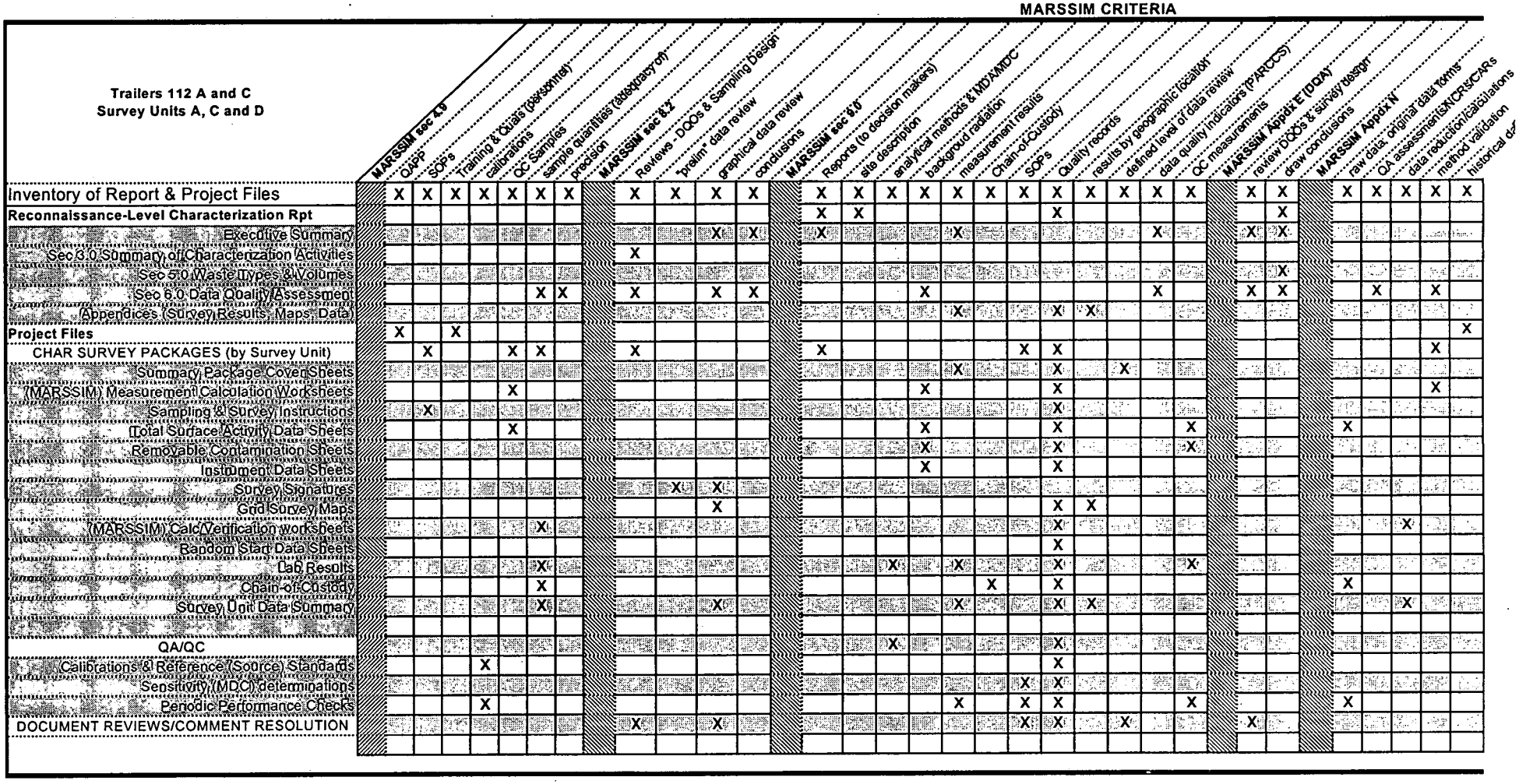
The DQA presented in this section supports conclusions through implementation of the guidelines taken from the following MARSSIM sections:

- §4.9, Quality Control
- §8.2, Data Quality Assessment
- §9.0, Quality Assurance & Quality Control
- Appendix E, Assessment Phase of the Data Life Cycle
- Appendix N, Data Validation using Data Descriptors

The MARSSIM-recommended criteria for verification and validation of Pre-Demolition (final status) survey data, listed above, are summarized in Table 5-1. The MARRSIM criteria are listed across the top of the table whereas the project's proof of implementation is listed along the left-hand side of the table. One or more "checks" per column exhibit compliance with the MARSSIM criteria.

As stated previously, the decisions for both Trailers 112A and 112C are that contamination levels are below free-release criteria, for chemicals and radionuclides. The conclusion with respect to radiological contamination is derived with 95% confidence based on use of MARSSIM methodology in the survey units' design.

Table 5-1 Trailers 112A and C Survey Compliance with MARSSIM Data Quality Guidelines



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5.1 VERIFICATION OF RESULTS

Verification ensures that data produced and used by the project are documented and traceable per quality requirements. Verification consisted of reviewing the project's data relative to three subsets:

1. Radiological scans,
2. Radiological static surveys for removable and total contamination, and
3. Radiochemical data resulting from samples taken and subsequently analyzed via alpha spectrometry.

Verification confirmed that:

- Chain-of-custody was intact from initial sampling though transport and final analysis;
- Preservation and hold-times were within tolerance;
- Format and content of the data are clearly presented relative to goals of the project, i.e., to determine, with at least 95% confidence, that the survey units of interest (T112A and T112C) are adequate for radiological free release.

Verification of the T112A and C Trailers RLC data also confirmed the presence of quality records representing implementation of the following quality controls:

- Calibrations (radiochemistry, surveys and scans), for accuracy;
- Laboratory control samples (LCS -- radiochemistry), for accuracy;
- Blanks (radiochemistry), for accuracy;
- Duplicate measurements (radiochemistry surveys and scans), for precision;
- Chemical yield (radiochemistry), for accuracy;
- Count times (radiochemistry surveys and scans), for sensitivity;
- Sample preparations (radiochemistry), for accuracy, representativeness.

Items requiring survey coverage were verified as follows:

- A grid survey map was developed for each survey unit.
- The grid survey maps served as an index of the subunits, and defined the subunit boundaries.
- Each grid survey map used to document Electra and Eberline surveys was reviewed against the trailer floor plan map for coverage.
- Because every grid survey map was correlated to a survey form, and all survey forms were inventoried via the survey summary sheet, 100% coverage of every subunit was assured.

Upon completion of the data management activities listed above, an independent peer review was performed on each survey package.

In summary, the verification confirmed that documentation and quality records are intact for the project, which in turn corroborates implementation of the required technical

quality controls and administrative requirements, particularly verification of those documents and records that will ultimately support the CERCLA Administrative Record. All relevant Quality records associated with T112A and T112C RLC decisions will be submitted to the RMRS Records Center for permanent storage within 30 days of the conclusion of the project.

5.2 VALIDATION OF RESULTS

Validation consisted of a technical review of all data that directly support the RLC decisions. Any limitations of the data relative to project goals are delineated, and the associated data are qualified accordingly. Data were validated relative to quality criteria discussed throughout previously noted MARSSIM sections and the PARCC parameters.

PARCC parameters are consistent with "data descriptors" in MARSSIM and address characteristics of the data that must be defined for scientific integrity and defensibility. The next section, which addresses the PARCC parameters -- Precision, Accuracy, Representativeness, Comparability, and Completeness, also include discussion on bias and sensitivity, two more data descriptors emphasized in MARSSIM.

Validation of analytical data to K-H contractual requirements (K-H Statements of Work) is currently performed on a site-wide basis at ~25% frequency by the K-H Analytical Services Division. Satisfactory validation at this frequency indicates that subcontracted laboratories are operating competently relative to industry-wide standards, and more specifically, that sample custody and analytical procedures are implemented under defined quality controls on a site-wide, programmatic basis. Site-wide data validation coupled with annual laboratory audits provide the inference that all analytical results not specifically validated are represented by the percentage that is validated. Radiochemistry performed for this RLC was verified as meeting K-H contractual requirements -- Module RC01-B.3 for alpha spectrometry (4/24/98 and Module 9, 7/6/98).

5.2.1 PRECISION

5.2.1.1 Radiological Surveys and Scans

Precision of the radiological instrumentation was satisfactory based on tolerance charting of daily source measurements for each individual sensor used on the project, which includes all measurement types (scans and static measures for total contamination and swipes for removable). Adequate precision was established through instrument performance within a ±20% range as defined by measurement results compared to a standard source value. Based on standard protocol (e.g., Procedures 1-P73-HSP-18.10, Radioactive Material Transfers and Unrestricted Release of Property and Waste, and 3-PRO-165-RSP-0702, Contamination Monitoring Requirements), any measurement exceeding the defined tolerance limits required corrective action (repair or replacement) prior to the instrument's use during pre-demolition survey.

Duplicate measurements were acquired for total and removable surface activity measurements at ≥30% frequency per survey unit. All duplicate measurements were within tolerance based on the acceptance criterion that both results be below Derived Concentration Guideline Level-Averaged Measures ($DCGL_W$) (note: even if populations were "significantly" different between real and duplicate results, if both duplicate and real population statistics are less than action levels, the difference between duplicate and real values is, ultimately, insignificant relative to free-release decisions).

5.2.1.2 Radiochemistry

Results from laboratory duplicates indicate adequate lab precision based on duplicate results within statistical tolerance values (>90% confidence of equivalency between the original sample and the duplicate). Although field duplicate samples were not acquired for determination of overall project precision, agreement between the two samples to within a range less than the $DCGL_W$ indicates that reproducibility is adequate for project decisions (i.e., relative to free-release of materials).

5.2.2 ACCURACY (and Bias)

5.2.2.1 Radiological Surveys and Scans

Accuracy of radiological surveys and scans is satisfactory based on RFETS-programmatic annual calibrations that establish instrument efficiencies and sensitivities for all instrumentation used on this project. Daily source checks also provided periodic checks to ensure that all sensors are within tolerance during daily operations. Calibration and calibration check results were within the RFETS and industry-standard requirement of 20% of the applicable reference standard values. Full-scale, multi-point calibrations provided accuracy of ± 10% prior to implementation of survey instruments in the field, consistent with guidelines put forth in ANSI-N323.d

Total beta results for Survey Unit A may appear to be biased low based on the consistently negative values (with an arithmetic average of -519 dpm/100cm) for the Unit A sample set. However, based on the method by which local area backgrounds were attained relative to measurements acquired within the 112A Trailer, negative values can be expected. Local area backgrounds for the NE Electra DP6 were determined at approximately 3 ft above ground level outside the trailer location; probes were held face up at waist level and underwent a 1-minute count time. In contrast, trailer-interior measurements are acquired at relatively higher elevations (above grade), and are shielded from much exterior "shine" within the trailer. As a result, the high background and/or low instrument bias would not appear to impact Survey Unit decisions, as the levels are significantly lower than the free-release action levels (5000 $dpm/100cm^2$).

Removable beta results might also appear to have a slight negative bias based on performance check results that are consistently below zero (i.e., within the negative acceptance range). Such instrument performance, when consistently below the standard reference values, suggests that instrument efficiency may need to be adjusted

upward for more accurate results. This is due to using an assumed minimum efficiency of 25% for BC 4s when actual efficiencies are higher. However, as discussed above, the magnitude of the negative values does not suggest a potential bias high enough to compromise survey unit decisions.

Several survey measurements for total alpha exceeded free-release levels, however, upon re-survey yielded results well below free-release levels. The re-survey results, which did not confirm the initial elevated values, indicate that initial results were false positives (i.e., initial readings were caused by naturally occurring radioactive progeny and were not DOE-added radionuclides of concern).

5.2.2.2 Radiochemistry

Accuracy of the radiochemical results were within tolerance and acceptable based on the associated results of laboratory control samples and calibrations at the laboratory. Preparation blanks also confirmed that no significant cross-contamination occurred in the analysis process. Uncertainties of the radiochemical results are quantified for each sample by both 2-sigma error (probabilistic) and total error (systematic + probabilistic). Uncertainties associated with the alpha-spectrometry analyses were within standard industry magnitudes.

5.2.3 REPRESENTATIVENESS

Samples, surveys and scans are representative based on the following criteria:

- Familiarity with facilities -- multiple walk-downs and collaborations by management and technical staff;
- Implementation of industry-standard chain-of-custody protocols;
- Compliance with sample preservation and hold times;
- Documented and (site) approved methods;
- Radiochemistry - (alpha spectrometry) via K-H Module RC01-B.3;
- Radiological surveys via *Contamination Monitoring Requirements* (3-PRO-165-RSP-07.02);

Quality Assurance assessments were limited to the DQA presented in this section; no other site assessments were performed.

5.2.4 COMPLETENESS

The data set for this project is complete, with respect to surveys scans, samples and associated quality records ("data packages") resulting from the characterization process. Table 6-2 summarizes the minimum required number of samples surveys/scans, the actual quantity of samples/surveys/scans to date, and whether DQOs were achieved.

Table 5-2 Data Completeness Summary

Rad Measurement Type	Required # of Samples/ Surveys/Scans	Actual # of Samples/ Surveys/Scans	Comments
Survey Unit A (T112A Interior)			
Eberline SAC-4 (removable alpha)	13	16	DQO achieved
Eberline BC-4 (removable beta)	13	16	DQO achieved
NE Electra (total alpha and beta)	13	16	DQO achieved
Survey Unit C (T112C Interior and Exterior)			
Eberline SAC-4 (removable alpha)	13	16	DQO achieved
Eberline BC-4 (removable beta)	13	16	DQO achieved
NE Electra (total alpha and beta)	13	16	DQO achieved
Survey Unit D (T112A Exterior)			
Eberline SAC-4 (removable alpha)	13	16	DQO achieved
Eberline BC-4 (removable beta)	13	16	DQO achieved
NE Electra (total alpha and beta)	13	16	DQO achieved
Radiochemical	0	2	DQO achieved

Consistent with the DQO process, the sampling design was optimized through back-calculating actual measurement results (acquired during RLC) and comparing model output with original estimates. The Post Survey Removable Contamination Summary Statistics Calculation verification worksheets for each survey unit are included in Appendices 2,3 and 4. Use of actual sample/survey/scan (result) variances in MARSSIM's DQO model provided confirmation that an adequate number of samples/surveys/scans had been acquired. Inputs required for decision-making, as stated in the original (planning) DQOs, were acquired, including coverage of originally-planned, 3-dimensional boundaries of the structure. All radiological results are valid without qualification, and form data sets with adequate quantities and quality of data for free-release decisions on the three survey units (2 trailers) of interest.

5.2.5 COMPARABILITY

All results presented are comparable with radiological survey/scan and radiochemistry data on a site- and DOE-complex wide basis. This comparability is based on:

- Use of standardized engineering units in the reporting of measurement results

- Consistent sensitivities of measurements at approximately 50% or less of the $DCGL_W$ (approximately 50% or less of the $DCGL_{EMC}$ for scans)
- Use of site-approved procedures
- Systematic quality controls
- Thorough documentation of the planning, sampling/analysis process, and data reduction into formats designed for making decisions based on the project's original data quality objectives.

5.2.6 SENSITIVITY

Adequate sensitivities, in units of dpm/100 cm^2, were attained for all surveys/scans and radiochemical methods implemented based on minimum detectable activities (MDAs) at 50% of the transuranic $DCGL_W$ ($\leq$ 50% $DCGL_{EMC}$ for scans). The nominal MDAs for each survey and radiochemical method are summarized as follows:

- Removable alpha contamination (Eberline SAC-4): 8.3 dpm/100cm^2;
- Removable beta contamination (Eberline BC-4): 200 dpm/100cm^2;
- Total alpha contamination (NE Electra): 49 dpm/100cm^2;
- Total beta contamination (NE Electra): 351 dpm/100cm^2;
- Radiochemistry (Alpha Spectrometry): 7.9 dpm/100cm^2 (converted from 0.119 pCi/g).

5.2.7 OTHER QA ELEMENTS

All personnel performing activities affecting quality within the RLC project were qualified to perform their specific tasks. Suitable training and qualification documentation for personnel performing the work, from the laborers to technical professionals to management, is documented by the RMRS Training Department. In addition, Quality Assurance assessments were limited to the DQA presented in this section; no other site assessments were performed.

5.2.8 DQA SUMMARY

In summary, the data presented in this report have been verified and are qualified as valid and complete for comparison with free-release criteria (action levels) as stated in the DQOs. All media sampled, surveyed and scanned relative to both total and removable alpha activities, yielded results less than action levels for the associated contaminants of concern. Therefore, Survey Units A, C, and D meet the free-release criteria with the statistical confidence stated in this section and throughout the report.

6.0 CLASSIFICATION OF TRAILERS T112A and T112C

Based on the analysis of radiological, chemical and physical hazards, trailers T112A and T112C are classified as Type I Facilities (i.e., "free of contamination") pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1998a). Classification was based on a review of historical and process knowledge, historical radiological and chemical data, and newly acquired RLC data. Results indicate no radioactive or chemical contamination exists and no significant physical hazards are present. Trailer 112A contains asbestos as part of the floor tile, which is considered an integral part of the structure.

7.0 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment."

DOE Order 414.1, "Quality Assurance."

EPA, 1994. "The Data Quality Objective Process," EPA QA/G-4.

K-H, 1997. "Kaiser-Hill Team Quality Assurance Program", Rev. 5, 12/97

K-H, 1998a. Decommissioning Program Plan, October 8, 1998.

K-H, 1998b. Facility Disposition Program Manual, MAN-076-FDPM.

K-H, 1999a. Decontamination and Decommissioning Characterization Protocol.

K-H, 1999b. Reconnaissance Level Characterization Plan

MARSSIM – Multi-Agency Radiation Survey and Site Investigation, 12/97 (NUREG-1575, EPA 402-R-97-016).

RFETS, D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report

RFETS Chronic Beryllium Disease Prevention Program, "List of Known Beryllium Areas"

RFETS, Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*

RFETS, Environmental Waste Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*

RMRS, 1998. Quality Assurance Program Description, RMRS-QAPD-001, Rev. 2, 4/98

Appendix 1

Historical Site Assessment

Facility Summary

T112A - This unit has been unoccupied since 3/99, it is assembled from five Trailers. The unit was always used for office space, by either Plant Traffic, the Employee Store, Transportation Security, or Telecommunications offices. What is left inside are wall hung fire extinguishers, bolted to wall wooden bookshelves, toilet fixtures in the men/women restrooms, partitions, acoustical ceiling tiles, and the doors are hung.The exterior doors remains and have cipher locks. The exterior doors (4) have wooden weather protection porches. The interior and exterior is in good condition. On the east side of the trailer, approximately 2-3 feet away from the east wall, there is a utility pole, and at the southwest corner there is a de-energized transformer. These are physical hazards that will have to be worked around, when this unit is relocated. From all historical searches, interviews, and historical data located, there has never been any Radioactive material or chemicals stored inside of this trailer. Radiological survey data is not available. However, there is asbestos data available, that indicates there is asbestos containing material in the floor tile.

T112C - This unit has been unoccupied since 1998. It's a singlewide trailer always used as office space. Currently inside, are doors, acoustical ceiling tiles, partitions, wall hung fire extinguishers, and in a separate room there is telecommunication equipment and a fire water riser with controls. The unit is in good condition. However, some siding has been blown loose from the wind. From all historical searches, interviews, and other historical data located, there has never been any Radioactive material or chemical hazards found in any historical data, interviews, or other historical searches, and there are no physical hazards. However, the wood construction at both doors will have to be removed before the trailer is removed.

HISTRORICAL FACILITY OVERVIEW
FOR TRAILER T- 112A

1.0 This trailer was constructed/assembled at this site, Central Avenue and Fourth Street, behind the northwest corner of Building 112, in the early1960s. The size of this trailer is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' feet in size. There are four doors leading into this trailer, two on the east and two on the west. All of the entry doors are covered; the entry covers range in size from 4' X 4' to 6' X 6'. The siding and the skirting, which is approximately 28" high, around the bottom of the trailer are enamel on aluminum. Structurally the trailer is sound, there are no leaks in the ceiling and the outside has no damage. The foundation that this office trailer sets on is concrete blocks and the tie-down method for the unit is steel cable from the trailers I-beams secured to concrete caissons. The interior outside walls is wood paneling over insulation, the interior partition wall is wood paneling on stud framing, and the floor is carpet and sheet vinyl/linoleum on wood. The ceiling is a drop type with acoustical tile panels up to 12 feet long at various widths. All four doors on this trailer office facility have cipher locks on them.

2.0 Prior to the Radio & Pager Operations moving into T-112A, the south half was used for I&ET/Telecommunications offices. The Plant Traffic Department for Plant travel originally occupied the north section of T-112A. The south half of T-112A was a Company Store when the RFETS was operated by Rockwell International (from approximately 1975 to 1990). Later the north section of T-112A was used by Traffic's Transportation Security Office (TSO) Scheduling. Both the I&ET and TSO groups vacated this trailer office building in approximately March, 1999. The trailer has Men and Women restroom facilities. The Men's restroom has a hot water heater for the facility. No other equipment remains in the trailer. Some books and trash remain throughout inside of the trailer. At the present time this trailer is unoccupied and Unoccupied Signs have recently been added to the four entry doors of the facility.

3.0 The utilities for this trailer consist of electric heat pumps (5 total) for both heating and air conditioning. T-112A has a smoke detection system and is connected to the Plant Fire Alarm System. A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T-112A. There are no engineering drawings for this trailer. A room layout drawing for this unit is available. Photographs of the exterior and interior of T-112A are available. Radiological surveys may have been done, but data is not available. This trailer will be resurveyed to meet present standards for release. The plant stopped the use of lead based paint in1989, this trailer, if painted before this date may have been painted with lead based paint. Asbestos characterization data exists for the T-112A Unit, according to Kevin Sheehan, X7250, T-452D. No chemicals were used or stored in this trailer. No WSRIC has been done on this trailer. There are no PATS outstanding on this trailer. (See the Facility Planning layout sketch and exterior/interior photographs behind Tab #13 in this Manual.)

Type 1 Facility Checklist

TYPE 1 FACILITY: Trailer (T112A)

CURRENT LANDLORD: RFCSS

DATE OF COMPLETION: 7/15/99

ITEM	YES	NO
Does the facility contain radiological postings?		X
Does the facility contain chemical postings?		X
Are there any installed hazards?		X
Do the historical surveys (radiological and chemical) indicate that the facility is clean?	X	
Are there RCRA units within the facility?		X
Is there a history of the building available?	X	
Is there any equipment/furniture left in the facility? Fire Extngrs., wooden book shelves bolted to walls, toilet fixtures, water heater	X	
Is there a future mission identified for the facility?		X
Will the facility be left unsecured after it is vacated?		X

If any answer to any of the above questions is "Yes", complete the following questions and complete the "graded" PEP in accordance with chapter 2.

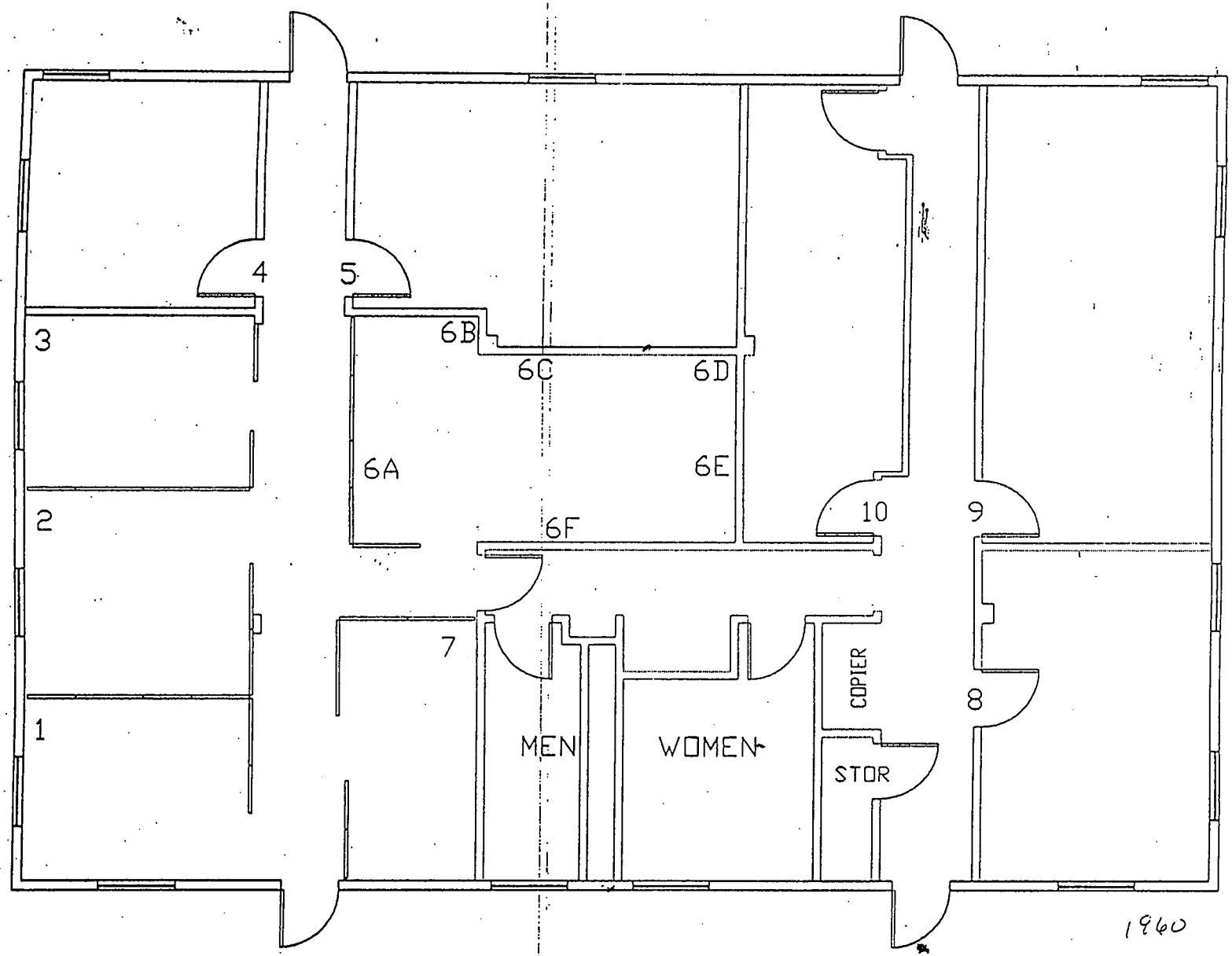
Note: An answer of "Yes" to any question, specifically one dealing with hazards, may indicate the facility is not a Type 1 Facility. Check with the D&D Programs office.

If the answer to all questions is "No" complete the "graded" PEP in accordance with Chapter 2.

1. List the Radiological Hazards, location, and quantity: None
Based on Historical Data found and interviews taken, there are no RAD hazards in this trailer.

2. List the Chemical Hazards, location, and quantity: None. Based on historical data and interviews taken, there are no chemical hazards in this trailer.
There is Asbestos Containing Material (ACM) in the floor tile.

3. List the Physical Hazards:
Elec. power pole near middle of east wall and de-energized transformer at the Southwest corner



T-112A

N

0 2 4 8 16

DATE: 12-14-98

HISTORICAL FACILITY OVERVIEW
FOR TRAILER T-112C

1.0 This trailer was put in place at this site, Central Avenue and Fourth Street, in 1991. The size of Trailer T-112C is 14' - 0" X 60' - 3" X 13 ' - 10" at the roof edge (2' - 10" is skirting). There are two doors leading into this trailer on the south side with a cipher lock on the west one and a key lock on the east. The entryways are covered with wood panels. The west has wooden steps leading to it and the east has a truck dock and had a handicap access ramp that has been removed. The siding and the skirting around the bottom of the trailer are enamel baked on aluminum. Structurally the outside has a panel that has been torn loose and part of it has blown away, inside its condition is good. The interior outside walls is vinyl over 4' by 8' dry wall over insulation, the interior partition walls are the same materials on stud framing. The ceiling is a drop type with 2' by 4' acoustical tile panels and the floor is carpet over wood flooring.

2.0 This trailer has been used as offices all the time it has been on site. There are 6 hard walled rooms of which 5 are offices. The sixth contains the telecommunication equipment and the fire sprinkler controls. The last occupant was Wackenhut Services which, used it as a scheduling office. They moved out in1998. At the present time the trailer is unoccupied and Unoccupied Signs have recently been added to the two doors of the facility.

3.0 The utilities for this building are an electric heat pump for heating and cooling, a fire sprinkler system, and it is connected to the plant fire alarm and PA systems. The drawings for this trailer consist only of a Facility Planning lay out sketch. Radiological surveys may have been done, but the data is not available. This unit will be resurveyed to meet present standards for release. Asbestos characterization data exists for the T-112C Unit, according to Kevin Sheehan, X7250, T-452D. The tie down method and the support structure underneath is unknown because of the skirting all around the bottom. The plant stopped the use of lead based paint in 1989. This trailer if painted before this date may have been painted with lead based paint. No chemicals were used or stored in this trailer. No WSRIC has been done on this trailer. There are no PATS outstanding on this trailer. (See the Facility Planning sketch behind Tab # 13 in this Manual. Plant site aerial photos and outside and inside photos are behind Tab #13.)

Type 1 Facility Checklist

TYPE 1 FACILITY: Trailer (T112C)

CURRENT LANDLORD: RFCSS

DATE OF COMPLETION: 7/15/99

ITEM	YES	NO
Does the facility contain radiological postings?		X
Does the facility contain chemical postings?		X
Are there any installed hazards?		X
Do the historical surveys (radiological and chemical) indicate that the facility is clean?	X	
Are there RCRA units within the facility?		X
Is there a history of the building available?	X	
Is there any equipment/furniture left in the facility? Fire Extgrs.	X	
Is there a future mission identified for the facility?		X
Will the facility be left unsecured after it is vacated?		X

If any answer to any of the above questions is "Yes", complete the following questions and complete the "graded" PEP in accordance with chapter 2.

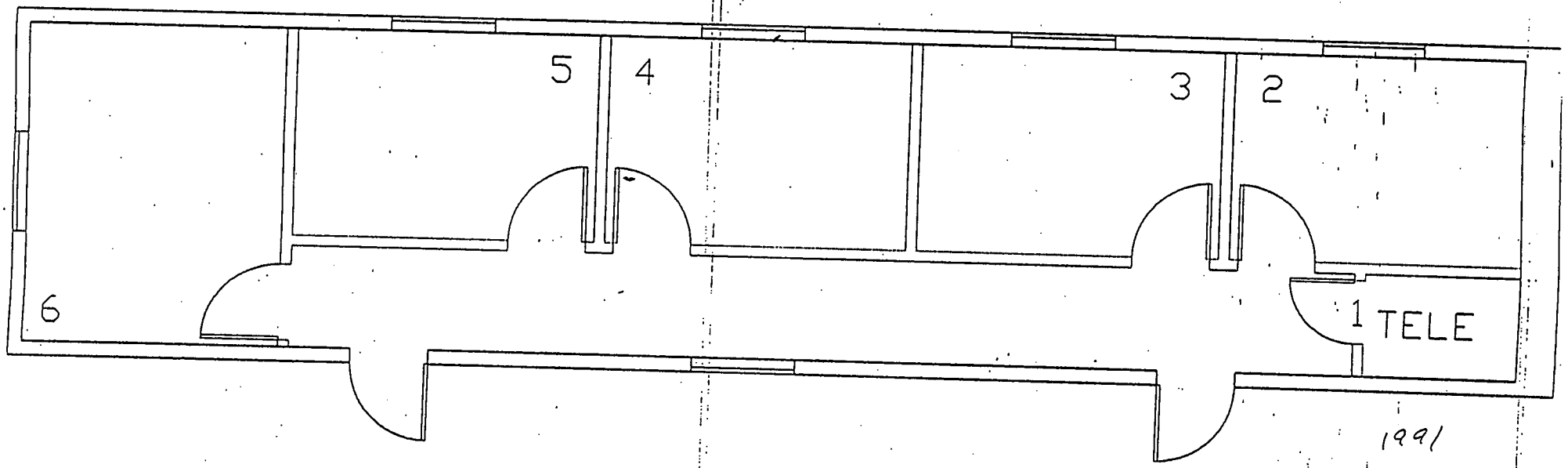
Note: An answer of "Yes" to any question, specifically one dealing with hazards, may indicate the facility is not a Type 1 Facility. Check with the D&D Programs office.

If the answer to all questions is "No" complete the "graded" PEP in accordance with Chapter 2.

1. List the Radiological Hazards, location, and quantity:
   Based on Historical data found and interviews taken, there are no known RAD Hazards in this trailer

2. List the Chemical Hazards, location, and quantity:
   Based on Historical Data found and interviews taken, there are no known Chemical hazards in this trailer

3. List the Physical Hazards:
   None



1991

T-112C (WSI TRAINING)

NORTH

0' 2' 4' 8' 16'

date: 12-14-98

40

1784 - T112B

Appendix 2

Radiological Survey Data for Interior of Trailer T112A (Survey Unit A)

Appendix 2

Radiological Survey Data for Interior of Trailer T112A (Survey Unit A)

APPENDIX 2 - Survey Unit A (Interior T112A)

- Survey Unit A Data Summary
- MARSSIM Calculation/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Maps

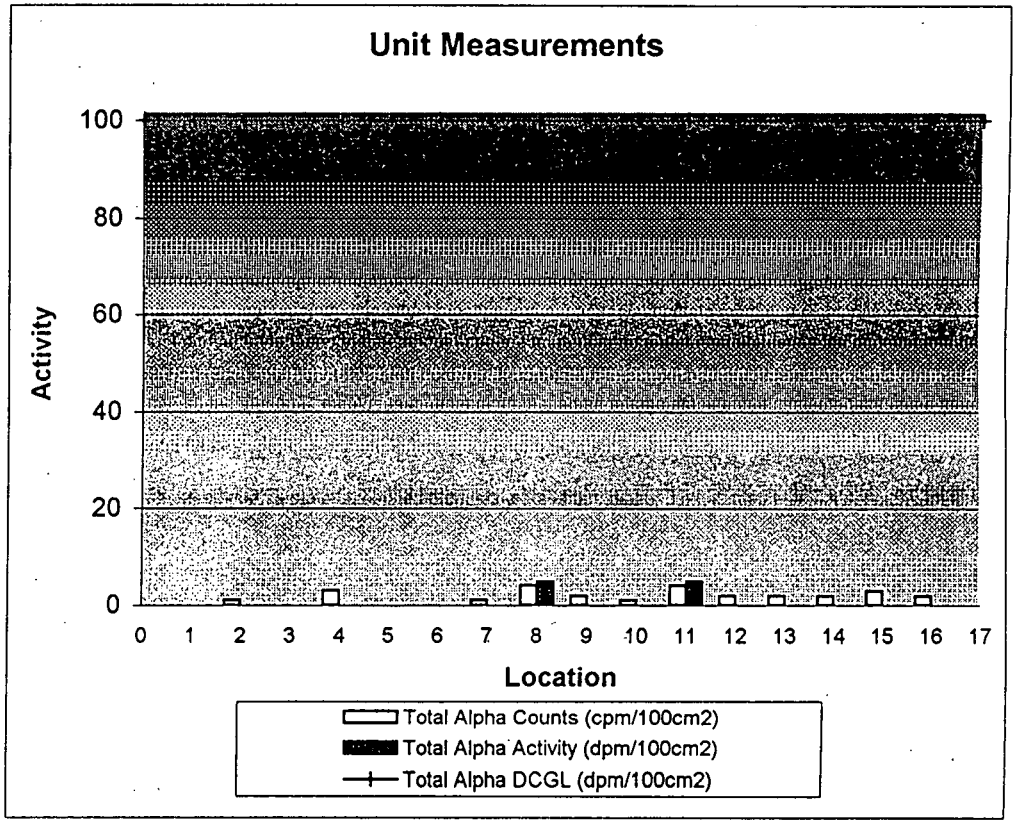
Total Alpha

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation:	6.333772	max:	5.0	Instrument background:	3 cpm
mean:	-6.125	min:	-14.0	Instrument efficiency:	21.9 %
median:	-5			Instrument MDA:	49 dpm

	Surface Location			Grid Location	Total Alpha Counts (cpm/100cm^2)	Total Alpha Activity (dpm/100cm^2)	Total Alpha DCGL (dpm/100cm^2)
1	Room	1	Wall	I1	0	-14	100
2	Room	2	Wall	P2	1	-9	100
3	Room	4	Floor	A6	0	-14	100
4	Room	4	Ceilling	A4	3	0	100
5	Room	4	Ceilling	A6	0	-14	100
6	Room	5	Wall	H2	0	-14	100
7	Room	6	Floor	A1	1	-9	100
8	Room	6	Ceilling	B1	4	5	100
9	Room	6	Wall	H2	2	-5	100
10	Room	8	Wall	Q1	1	-9	100
11	Room	8	Wall	R2	4	5	100
12	Room	9	Floor	A3	2	-5	100
13	Room	9	Ceilling	B4	2	-5	100
14	Room	10	Ceilling	C2	2	-5	100
15	Room	11	Wall	K1	3	0	100
16	Room	12	Wall	K2	2	-5	100



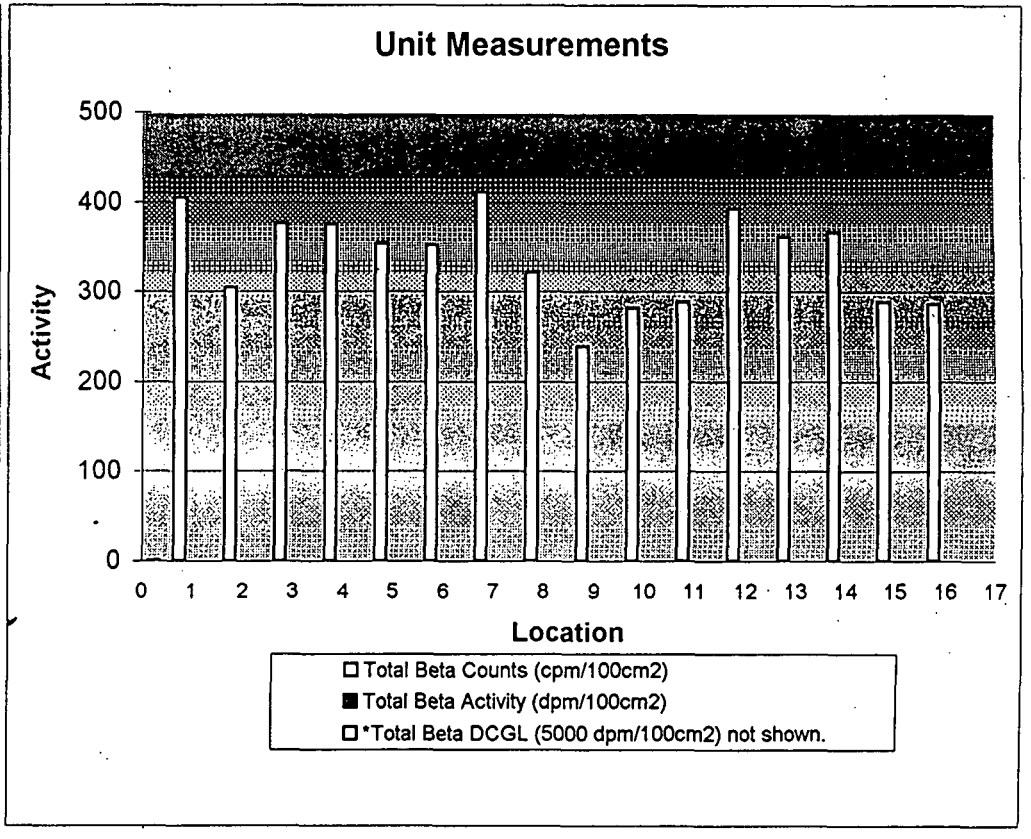
Total Beta

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation:	169.876	max:	-277.0	Instrument background:	495 cpm
mean:	-518.5	min:	-845.0	Instrument efficiency:	30.3 %
median:	-468.5			Instrument MDA:	351 dpm

	Surface Location			Grid Location	Total Beta Counts (cpm/100cm^2)	Total Beta Activity (dpm/100cm^2)	Total Beta DCGL (dpm/100cm^2)
1	Room	1	Wall	I1	405	-297	5000
2	Room	2	Wall	P2	304	-630	5000
3	Room	4	Floor	A6	377	-389	5000
4	Room	4	Ceilling	A4	376	-393	5000
5	Room	4	Ceilling	A6	354	-465	5000
6	Room	5	Wall	H2	352	-472	5000
7	Room	6	Floor	A1	411	-277	5000
8	Room	6	Ceilling	B1	322	-571	5000
9	Room	6	Wall	H2	239	-845	5000
10	Room	8	Wall	Q1	282	-703	5000
11	Room	8	Wall	R2	288	-683	5000
12	Room	9	Floor	A3	393	-337	5000
13	Room	9	Ceilling	B4	362	-439	5000
14	Room	10	Ceilling	C2	367	-422	5000
15	Room	11	Wall	K1	288	-683	5000
16	Room	12	Wall	K2	286	-690	5000



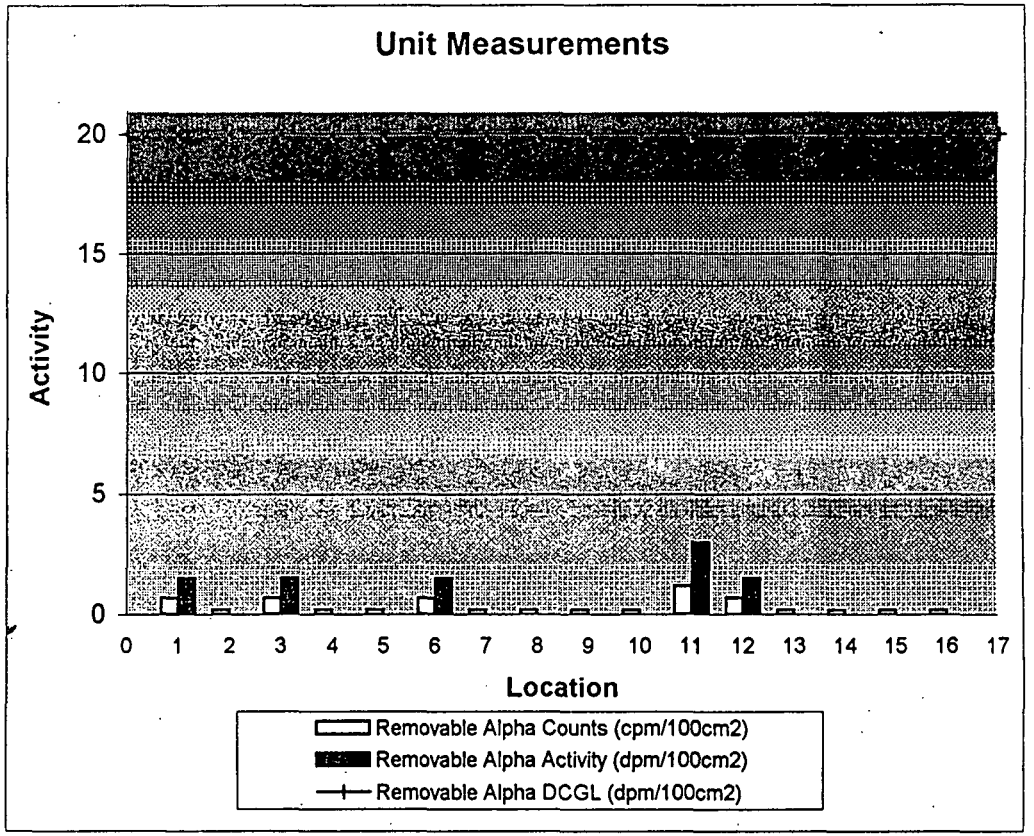
Removable Alpha

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation:	0.928709	max:	3.0	Instrument background:	0.2 cpm
mean:	0.5625	min:	0.0	Instrument efficiency:	33 %
median:	0			Instrument MDA:	7.6 dpm

	Surface Location			Grid Location	Removable Alpha Counts (cpm/100cm^2)	Removable Alpha Activity (dpm/100cm^2)	Removable Alpha DCGL (dpm/100cm^2)
1	Room	1	Wall	I1	1	1.5	20
2	Room	2	Wall	P2	0	0	20
3	Room	4	Floor	A6	1	1.5	20
4	Room	4	Ceilling	A4	0	0	20
5	Room	4	Ceilling	A6	0	0	20
6	Room	5	Wall	H2	1	1.5	20
7	Room	6	Floor	A1	0	0	20
8	Room	6	Ceilling	B1	0	0	20
9	Room	6	Wall	H2	0	0	20
10	Room	8	Wall	Q1	0	0	20
11	Room	8	Wall	R2	1	3	20
12	Room	9	Floor	A3	1	1.5	20
13	Room	9	Ceilling	B4	0	0	20
14	Room	10	Ceilling	C2	0	0	20
15	Room	11	Wall	K1	0	0	20
16	Room	12	Wall	K2	0	0	20



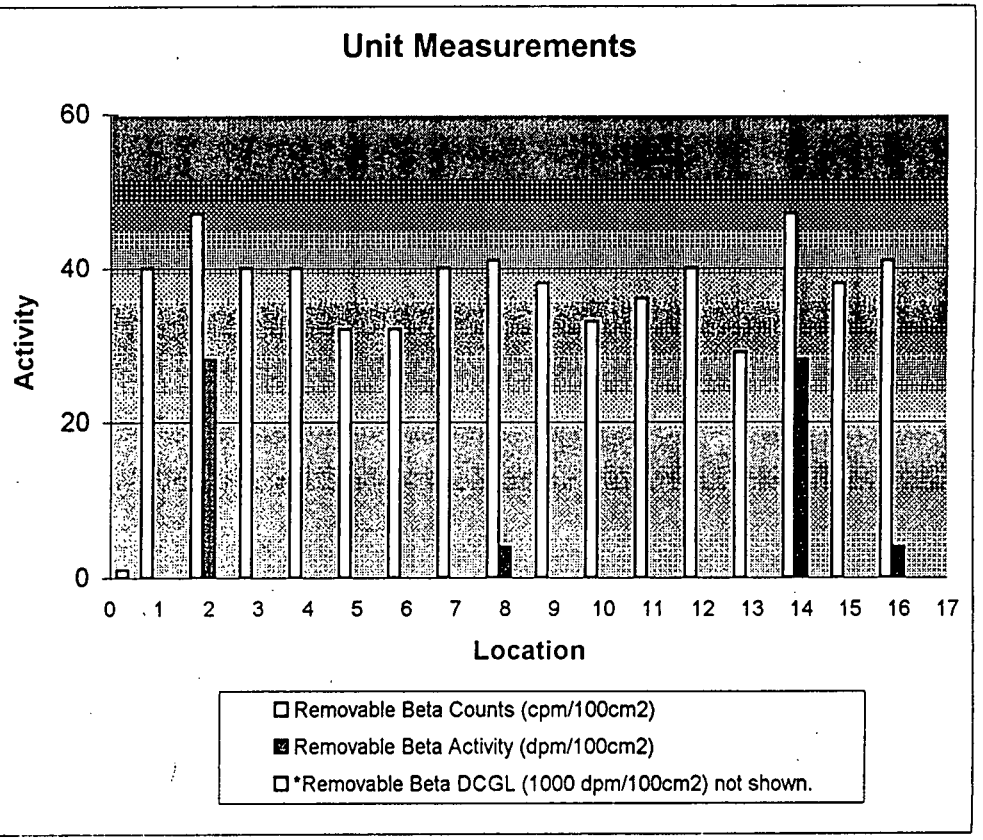
Removable Beta

Survey Unit A Data Summary - T112A Interior

August 18, 1999

standard deviation:	20.12627	max:	28.0	Instrument background:	40 cpm
mean:	-6.5	min:	-44.0	Instrument efficiency:	25 %
median:	0			Instrument MDA:	200 dpm

	Surface Location			Grid Location	Removable Beta Counts (cpm/100cm^2)	Removable Beta Activity (dpm/100cm^2)	Removable Beta DCGL (dpm/100cm^2)
1	Room	1	Wall	I1	40	0	1000
2	Room	2	Wall	P2	47	28	1000
3	Room	4	Floor	A6	40	0	1000
4	Room	4	Ceilling	A4	40	0	1000
5	Room	4	Ceilling	A6	32	-32	1000
6	Room	5	Wall	H2	32	-32	1000
7	Room	6	Floor	A1	40	0	1000
8	Room	6	Ceilling	B1	41	4	1000
9	Room	6	Wall	H2	38	-8	1000
10	Room	8	Wall	Q1	33	-28	1000
11	Room	8	Wall	R2	36	-16	1000
12	Room	9	Floor	A3	40	0	1000
13	Room	9	Ceilling	B4	29	-44	1000
14	Room	10	Ceilling	C2	47	28	1000
15	Room	11	Wall	K1	38	-8	1000
16	Room	12	Wall	K2	41	4	1000



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Survey Area: T112	**Building:** T112A
Survey Unit: A (T112A Interior)	

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit A removable surface contamination data are calculated on the "Survey Unit A Data" sheet. Because all removable survey measurement results are less than $DCGL_W$ (alpha less than 20 dpm/100 cm^2, beta less than 1000 dpm/100 cm^2), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the $DCGL_W$. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the $DCGL_W$.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit A are: α 0.93 β 20.1

Thus, the ACTUAL required number of measurements is as follows:

α:

$\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/ SD_{REMOVABLE}$

$\Delta/\delta_{transuranics} = (20 \text{ dpm}/100\text{cm}^2 - 10 \text{ dpm}/100\text{cm}^2)/ 0.93 \text{ dpm}/100\text{cm}^2 = 11$

β:

$\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/ SD_{REMOVABLE}$

$\Delta/\delta_{transuranics} = (1000 \text{ dpm}/100\text{cm}^2 - 500 \text{ dpm}/100\text{cm}^2)/ 20.1 \text{ dpm}/100\text{cm}^2 = 24.9$

Where:

Δ/δ	is the relative shift or the resolution of measurements in units of measurement uncertainty
$DCGL_{REMOVABLE}$	is the removable surface contamination derived concentration guideline value (DOE Order 5400.5 removable surface contamination limit equals 20 dpm/100cm^2 for transuranics per the T112A-C Pre Demolition Survey Plan)
$LBGR_{REMOVABLE}$	is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to value utilized in original sample size calculation).
$SD_{REMOVABLE}$	is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112	Building: T112A
Survey Unit: A (T112A Interior)	

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

α

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

β

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

Where:

1.645 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$N = \underline{10.9} * 1.2 = \underline{13}$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 α and β Removable Surface Contamination measurements were required in Unit A.

Step 4:

Draw conclusions from the data: All measurements are less than $DCGL_W$. The minimum number of required removable survey measurements were collected. Thus, survey unit Unit A complies with the removable contamination release criteria.

DAVID A. BARNES	[redacted]		8-18-99
Prepared By: Printed Name		Radiological Engineer Signature	Date
[illegible]			8/18/99
Reviewed By: Printed Name		Radiological Engineer Signature	Date

Survey Area: T112	Building: T112A
Survey Unit: A (T112A Interior)	

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit A data are calculated on the "Survey Unit A Data" sheet. Because all total surface activity (TSA or TSC) measurement results are less than $DCGL_W$ (less than 100 dpm/100 cm^2) , the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the $DCGL_W$. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the $DCGL_W$.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit A are: α 6.3 β 170

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA})/ SD_{TSA}$$

α

$$\Delta/\delta_{transuranics} = (100 \text{ dpm}/100\text{cm}^2 - 50 \text{ dpm}/100\text{cm}^2)/ 6.3 \text{ dpm}/100\text{cm}^2 = 7.9$$

β

$$\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100\text{cm}^2 - 2500 \text{ dpm}/100\text{cm}^2)/ 170 \text{ dpm}/100\text{cm}^2 = 316$$

Where:

Δ/δ	is the relative shift or the resolution of measurements in units of measurement uncertainty
$DCGL_{TSA}$	is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface Activity limit equals 100 dpm/100cm^2 for transuranics and 5000 dpm/100cm^2 for uranium, per the T112A-C Pre Demolition Survey Plan)
$LBGR_{TSA}$	is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to the value utilized in the original sample size calculation).
SD_{TSA}	is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112	Building: T112A
Survey Unit: A (T112A Interior)	

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following

MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

α and β

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

Where:

1.646 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$N = \underline{10.9} * 1.2 = \underline{13}$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit A.

Step 4:

Draw conclusions from the data: All measurements are less than $DCGL_W$. The minimum number of required TSA measurements were collected. Thus, survey Unit A complies with the TSA release criteria.

DAVID A. BARNES	[redacted]		8-18-99
Prepared By: Printed Name		Radiological Engineer Signature	Date
ES TABROOKS			8/24/99
Reviewed By: Printed Name		Radiological Engineer Signature	Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.2 cpm	Bkg.	0.1 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	7.6 dpm	MDA	6.5 dpm	MDA	

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech
Model	BC-4	Model	BC-4	Model	Electra
Serial#	700	Serial#	770	Serial#	1255
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	9/16/99
Bkg.	40 cpm	Bkg.	38 cpm	Bkg.	3 | 495 cpm
Efficiency	25 %	Efficiency	25 %	Efficiency	21.9 | 30.3 %
MDA	200 dpm	MDA	200 dpm	MDA	49 | 351 dpm

Survey Type: CONTAMINATION SURVEY
Building: T122A Interior
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-11-99 Time: 14:30

RCT: Hersey / Hersey
Print name Signature

RCT: Espinoza / Espinoza
Print name Signature

PRL #:

Comments: All results in scans were approx. equal to background except ave. points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A ROOM 1 WALL I2	<7.6	<200	<49	<351
2	T112A ROOM 2 WALL P2	<7.6	<200	<49	<351
3	T112A ROOM 4 FLOOR A6 *	<7.6	<200	<49	<351
4	T112A ROOM 4 CEILING A4	<7.6	<200	<49	<351
5	T112A ROOM 4 CEILING A6	<7.6	<200	<49	<351
6	T112A ROOM 5 WALL H2	<7.6	<200	<49	<351
7	T112A ROOM 6 FLOOR A1 *	<7.6	<200	<49	<351
8	T112A ROOM 6 CEILING B1	<7.6	<200	<49	<351
9	T112A ROOM 6 WALL H2	<7.6	<200	<49	<351
10	T112A ROOM8 WALL Q1	<7.6	<200	<49	<351
11	T112A ROOM R2 *	<7.6	<200	<49	<351
12	T112A ROOM 9 FLOOR A3 *	<7.6	<200	<49	<351
13	T112A ROOM 9 CEILING B4	<7.6	<200	<49	<351
14	T112A ROOM 10 CEILING C2	<7.6	<200	<49	<351
15	T112A ROOM 11 WALL K1 *	<7.6	<200	<49	<351
16	T112A ROOM 12 WALL K2	<7.6	<200	<49	<351
	N/A				

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#3			<49	<351
QA	#7			<49	<351
QA	#11	N/A		<49	<351
QA	#12			<49	<351
QA	#15			<49	<351
	N/A				

ate Reviewed: 8/13/99 RS Supervision: S Eagle (for) [signature]
Print Name Signature

T112A interior MDA

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SCAN HI POINTS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

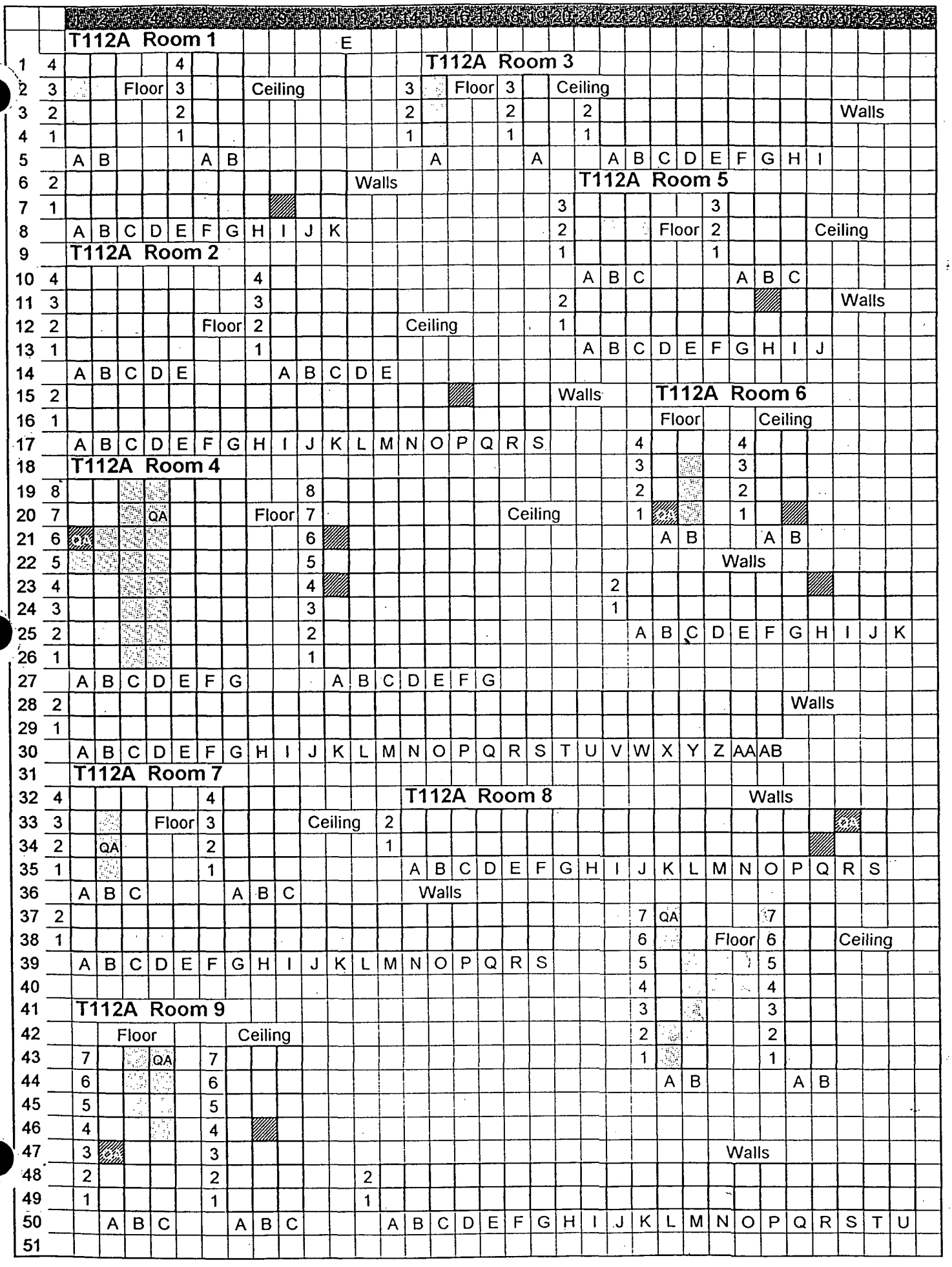
Continuation Sheet

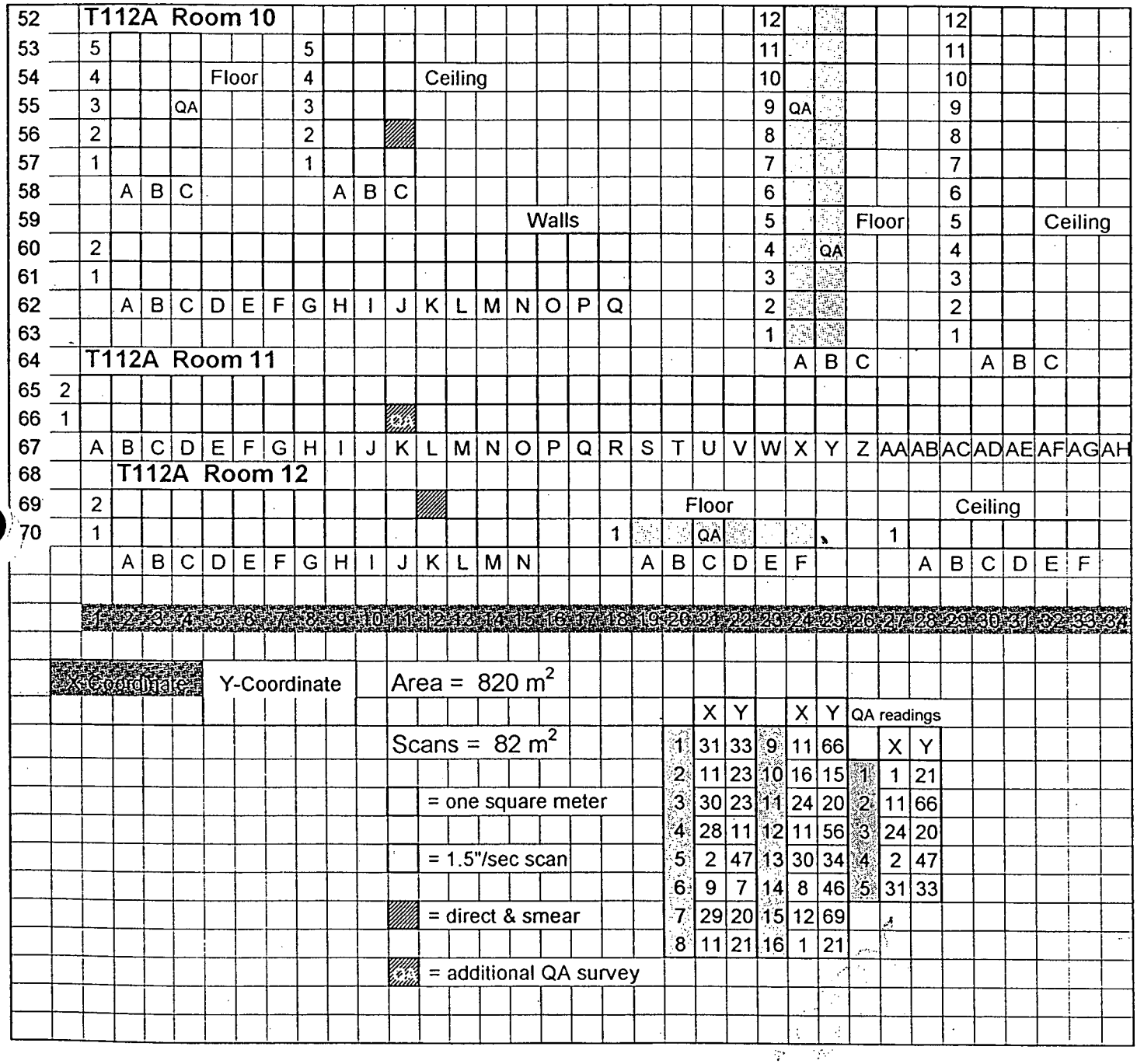
SURVEY RESULTS

Swipe #	Location/Description Results in DPM/100CM^2	Removable		Total		Swipe #	Location/Description Results in DPM/100CM^2	Removable		Total	
		Alpha	Beta	Alpha	Beta			Alpha	Beta	Alpha	Beta
1	T112A ROOM 3 FLOOR A1			78	512						
2	T112A ROOM 4 FLOOR D8			78	512						
3	T112A ROOM 11 FLOOR B12	N/A		78	512						
4	T112A ROOM 11 FLOOR B2			78	512						
	N/A						N/A				

Date Reviewed: 8/13/99 RS Supervision: S. Engelhard [redacted]

Print Name Signature


T112A Room 1
T112A Room 3
T112A Room 5
T112A Room 2
T112A Room 6
T112A Room 4
T112A Room 7
T112A Room 8
T112A Room 9
Floor
Ceiling
Walls
QA



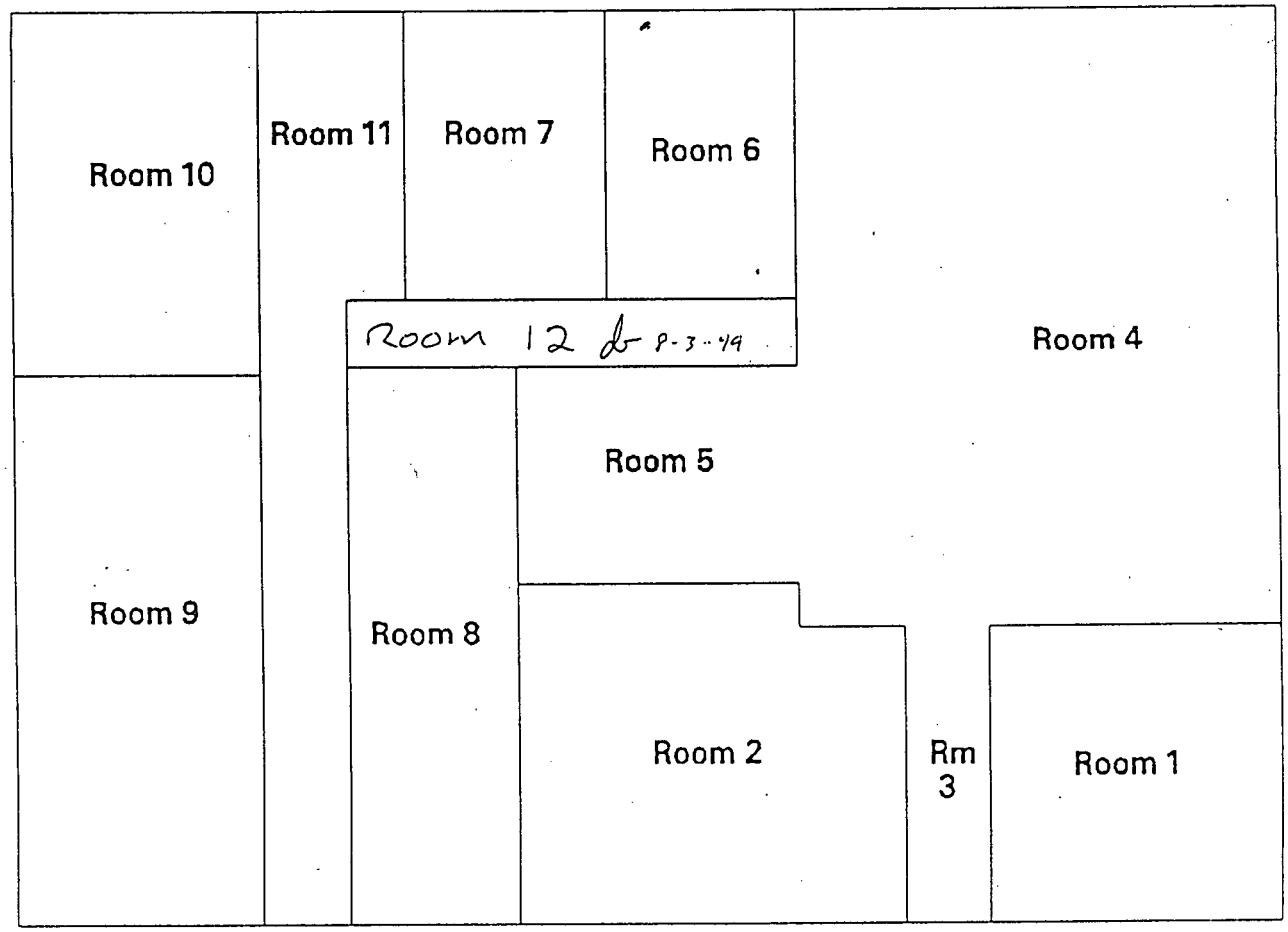
	X	Y		X	Y
1	31	33	9	11	66
2	11	23	10	16	15
3	30	23	11	24	20
4	28	11	12	11	56
5	2	47	13	30	34
6	9	7	14	8	46
7	29	20	15	12	69
8	11	21	16	1	21

	X	Y
1	1	21
2	11	66
3	24	20
4	2	47
5	31	33

6/03

afloorplan.xls

Building T112A Floorplan



ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.2 cpm	Bkg.	0.1 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	7.6 dpm	MDA	6.5 dpm	MDA	

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech
Model	BC-4	Model	BC-4	Model	Electra
Serial#	700	Serial#	770	Serial#	1255
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	9/16/99
Bkg.	40 cpm	Bkg.	38 cpm	Bkg.	3 | 495 cpm
Efficiency	25 %	Efficiency	25 %	Efficiency	21.9 | 30.3 %
MDA	200 dpm	MDA	200 dpm	MDA	49 | 351 dpm

Survey Type: CONTAMINATION SURVEY
Building: T122A Interior
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-11-99 Time: 14:30

RCT: Hersey / [redacted]
Print name Signature

RCT: Espinoza / [redacted]
Print name Signature

PRL #:

Comments: All results in scans were approx. equal to background except ave. points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A ROOM 1 WALL I2 (M1)	1.5	0	-14	-297
2	T112A ROOM 2 WALL P2	0.0	28	-9	-630
3	T112A ROOM 4 FLOOR A6 *	1.5	0	-14	-389
4	T112A ROOM 4 CEILING A4	0.0	0	0	-393
5	T112A ROOM 4 CEILING A6	0.0	-32	-14	-465
6	T112A ROOM 5 WALL H2	1.5	-32	-14	-472
7	T112A ROOM 6 FLOOR A1 *	0.0	0	-9	-277
8	T112A ROOM 6 CEILING B1	0.0	4	5	-571
9	T112A ROOM 6 WALL H2	0.0	-8	-5	-845
10	T112A ROOM8 WALL Q1	0.0	-28	-9	-703
11	T112A ROOM ~~B2~~ * 8 WALL R2	3.0	-16	5	-683
12	T112A ROOM 9 FLOOR A3 *	1.5	0	-5	-337
13	T112A ROOM 9 CEILING B4	0.0	-44	-5	-439
14	T112A ROOM 10 CEILING C2	0.0	28	-5	-422
15	T112A ROOM 11 WALL K1 *	0.0	-8	0	-683
16	T112A ROOM 12 WALL K2	0.0	4	-5	-690

N/A

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#3			-9	-366
QA	#7			-14	-327
QA	#11	N/A		9	-667
QA	#12			-9	-323
QA	#15			-5	-723

UNCONTROLLED FOR INFORMATION ONLY

N/A

Date Reviewed: _____ RS Supervision: _____ / _____ / _____
Print Name Signature Emp. #

COVER SHEET

	removable counts		total counts	
	alpha	beta	alpha	beta
1	1	40	0	405
2	0	47	1	304
3	1	40	0	377
4	0	40	3	376
5	0	32	0	354
6	1	32	0	352
7	0	40	1	411
8	0	41	4	322
9	0	38	2	239
10	0	33	1	282
11	2	36	4	288
12	1	40	2	393
13	0	29	2	362
14	0	47	2	367
15	0	38	3	288
16	0	41	2	286
17				
18				
19				
20				
21			1	384
22			0	396
23			5	293
24			1	397
25			2	276
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

INFORMATION ONLY

SCAN HI POINTS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

Swipe #	Location/Description Results in DPM/100CM^2	Removable		Total		Swipe #	Location/Description Results in DPM/100CM^2	Removable		Total	
		Alpha	Beta	Alpha	Beta			Alpha	Beta	Alpha	Beta
1	T112A ROOM 3 FLOOR A1			78	512						
2	T112A ROOM 4 FLOOR D8			78	512						
3	T112A ROOM 11 FLOOR B12	N/A		78	512						
4	T112A ROOM 11 FLOOR B2			78	512						
	N/A						N/A				

INFORMATION ONLY

Date Reviewed: _____ RS Supervision: _____ / _____ /

Print Name Signature Emp. #

CONTINUATION SHEET

	REMOVABLE COUNTS		TOTAL COUNTS	
	ALPHA	BETA	ALPHA	BETA
1			20	650
2			20	650
3			20	650
4			20	650
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
12				
15				
16				
17				
18				
19				
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21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

	REMOVABLE COUNTS		TOTAL COUNTS	
	ALPHA	BETA	ALPHA	BETA
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
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68				
69				
70				
71				

INFORMATION ONLY

Electra Performance Test Log

Instrument Serial Number: 1255

Instrument Efficiency Alpha: 21.9% Beta: 30.3%

Instrument Calibration Due Date: 9-16-99

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Accl. (cpm)	Source Acceptable Range (sq)
680141 α	N/A	24830	5438	4350 to 6525
~~603927 β~~	~~N/A~~	~~22790~~	~~6899~~	~~5519 to 8279~~
603927 β	N/A	22723	6885	5508 to 8262

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
7/29/99	2	4970	Pass	444	6633	Pass	[redacted]	Munoz	
7/30/99	3	4850	Pass	419	6770	Pass		Munoz	
8/2/99	1	4810	Pass	458	6698	Pass		Munoz	
8/3/99	1	4890	Pass	458	6781	Pass		Munoz	
8/4/99	1	4950	Pass	461	6775	Pass		Munoz	
8/5/99	4	4970	Pass	434	6776	Pass		Munoz	
8/11/99	4	4910	PASS	534	6210	PASS		G Hasenkamp	
8/12/99	3	4960	PASS	507	6655	PASS		G. Hasenkamp	
8/16/99	2	4960	Pass	454	6804	Pass		Munoz	
8/17/99	4	4890	Pass	417	6569	Pass		Munoz	
/ /									
/ /									
/ /									

8 11-99

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REVIEWED BY: L N Cooper
RO SUPERVISOR PRINT NAME

Lee N Cooper 8-17-99
RO SUPERVISOR SIGNATURE DATE

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: 835 · ALPHA ☑ BETA ☐ · Calibration Due Date: 10-26-99

Start Date: 8-9-99 · End Date: 8-15-99 · Building: 549 · Location: [redacted]

Source: S/N [redacted] · D. P. M.: 24830 · Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D1	Gross Source cpm: 7403	Shift M5	Gross Source cpm:
Time: 0630	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7403	RCT Emp. #	Net Source cpm:
Hasenkamp / Hasenkamp	%Error: -9.16	(Print Name / Signature)	%Error:
(Print Name / Signature)		Shift D5	Gross Source cpm: 7053
Shift P1	Gross Source cpm:	Time: 0630	Bkg. cpm: 0.3
Time:	Bkg. cpm:	RCT Emp. # [redacted]	Net Source cpm: 7053
RCT Emp. #	Net Source cpm:	Hasenkamp / [redacted]	%Error: -13.9
(Print Name / Signature)	%Error:	(Print Name / Signature)	
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D2	Gross Source cpm: 7081	Shift M6	Gross Source cpm:
Time: 0630	Bkg. cpm: 0.2	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7081	RCT Emp. #	Net Source cpm:
HASENKAMP / Hasenkamp	%Error: -13.8	(Print Name / Signature)	%Error:
(Print Name / Signature)		Shift D6	Gross Source cpm:
Shift P2	Gross Source cpm:	Time:	Bkg. cpm:
Time:	Bkg. cpm:	RCT Emp. #	Net Source cpm:
RCT Emp. #	Net Source cpm:	(Print Name / Signature)	%Error:
(Print Name / Signature)	%Error:	Shift P6	Gross Source cpm:
Shift M3	Gross Source cpm:	Time:	Bkg. cpm:
Time:	Bkg. cpm:	RCT Emp. #	Net Source cpm:
RCT Emp. #	Net Source cpm:	(Print Name / Signature)	%Error:
(Print Name / Signature)	%Error:	Shift M7	Gross Source cpm:
Shift D3	Gross Source cpm: 6868	Time:	Bkg. cpm:
Time: 0630	Bkg. cpm: 0.2	RCT Emp. #	Net Source cpm:
RCT Emp. # [redacted]	Net Source cpm: 6868	(Print Name / Signature)	%Error:
HASENKAMP / Hasenkamp	%Error: -16.2	Shift D7	Gross Source cpm:
(Print Name / Signature)		Time:	Bkg. cpm:
Shift P3	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	%Error:
RCT Emp. #	Net Source cpm:	Shift P7	Gross Source cpm:
(Print Name / Signature)	%Error:	Time:	Bkg. cpm:
Shift M4	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	%Error:
RCT Emp. #	Net Source cpm:		
(Print Name / Signature)	%Error:		
Shift D4	Gross Source cpm: 6636		
Time: 0630	Bkg. cpm: 0.0		
RCT Emp. # [redacted]	Net Source cpm: 6636		
HASENKAMP / [redacted]	%Error: -16.5		
(Print Name / Signature)			

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: LN Cooper · [redacted] · 8-17-99

Signature · Emp. # · Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA [L] / BETA [ ]

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: B24 · Calibration Due Date: 10-13-99

Start Date: 8-16-99 · End Date: 8-22-99 · Building: 549 · Location: office

Source: S/N [redacted] · D. P. M.: 24830 · Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7479	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. [redacted]	Net Source cpm: 7479	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 7293	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7293	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -11.0	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm:	Shift M7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm:		
Time:	Bkg. cpm:		
RCT Emp. #	Net Source cpm:		
(Print Name / Signature)	% Error:		

$$\% \text{ ERROR} = \frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Net cpm = gross - background cpm

E = Efficiency=0.33 for the SAC-4 and 0.25 for the BC-4

63 Approved by: LN Cooper / LNCooper / [redacted] / 8-17-99

Signature · Emp. # · Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☒

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: 770 Calibration Due Date: 1-2-00

Start Date: 8-9-99 End Date: 8-15-99 Building: 549 Location: Office

Source: S[redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D1	Gross Source cpm: 5382	Shift M5	Gross Source cpm:
Time: 0630	Bkg. cpm: 37	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5345	RCT Emp. #	Net Source cpm:
HASENKAMP / Hasenkamp	%Error: -5.9	(Print Name / Signature)	%Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm: 5159
Time:	Bkg. cpm:	Time: 0630	Bkg. cpm: 39
RCT Emp. #	Net Source cpm:	RCT Emp. # [redacted]	Net Source cpm: 5120
(Print Name / Signature)	%Error:	HASENKAMP / Hasenkamp	%Error: -9.8
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D2	Gross Source cpm: 5182	Shift M6	Gross Source cpm:
Time: 0630	Bkg. cpm: 39	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5143	RCT Emp. #	Net Source cpm:
HASENKAMP / Hasenkamp	%Error: -9.0	(Print Name / Signature)	%Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D3	Gross Source cpm: 5277	Shift M7	Gross Source cpm:
Time: 0630	Bkg. cpm: 38	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5239	RCT Emp. #	Net Source cpm:
HASENKAMP / Hasenkamp	%Error: -7.7	(Print Name / Signature)	%Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D4	Gross Source cpm: 5130		
Time: 0620	Bkg. cpm: 42		
RCT Emp. # [redacted]	Net Source cpm: 5088		
HASENKAMP / Hasenkamp	%Error: -10.4		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CN Cooper / [signature] [redacted] 8-17-99

Signature Emp. #

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☑

SAC-4 / (BC-4) / LUDLUM 2929 · Counter Serial No.: 700 Calibration Due Date: ____

Start Date: 8-9-99 End Date: 8-15-99 Building: 549 Location: Office

Source: S[redacted] D. P. M.: 22723 Certification Due Date: 4/17

Shift M1
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D1
Time: 0630 Gross Source cpm: 5362
RCT Emp. # [redacted] Bkg. cpm: 39
Net Source cpm: 5323
% Error: -6.2
(Print Name / Signature)

Shift P1
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift M2
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D2
Time: 0630 Gross Source cpm: 5186
RCT Emp. # [redacted] Bkg. cpm: 41
Net Source cpm: 5145
% Error: -9.4
(Print Name / Signature)

Shift P2
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift M3
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D3
Time: 0630 Gross Source cpm: 5299
RCT Emp. # [redacted] Bkg. cpm: 40
Net Source cpm: 5259
% Error: -7.4
(Print Name / Signature)

Shift P3
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift M4
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D4
Time: 0620 Gross Source cpm: 5254
RCT Emp. # [redacted] Bkg. cpm: 43
Net Source cpm: 5211
% Error: -8.2
(Print Name / Signature)

E = Efficiency=0.33 for the SAC-4 and 0.25 for the BC-4

Shift P4
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift M5
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D5
Time: 0630 Gross Source cpm: 5308
RCT Emp. # [redacted] Bkg. cpm: 39
Net Source cpm: 5269
% Error: -7.2
(Print Name / Signature)

Shift P5
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift M6
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D6
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift P6
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift M7
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift D7
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

Shift P7
Time: ____ Gross Source cpm: ____
RCT Emp. # ____ Bkg. cpm: ____
Net Source cpm: ____
% Error: ____
(Print Name / Signature)

$$\% \text{ ERROR} = \frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$$

Net cpm = gross - background cpm

Approved by: CN Cooper / [signature] [redacted] 8-17-99
Signature

Survey Area: T112	Survey Unit: Unit A	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for implementation.

D. A. BARNES	[redacted]	8-3-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
H. B. LESTABROOKS	[redacted]	8/3/99
RE Peer Review Printed Name	RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

[illegible]	[redacted]	
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
[illegible]	[redacted]	8/18/99
RE Manager Printed Name	RE Manager Signature	Date

66

4/23

Survey Area: T112	Survey Unit: Unit A	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SAMPLING AND SURVEY INSTRUCTIONS

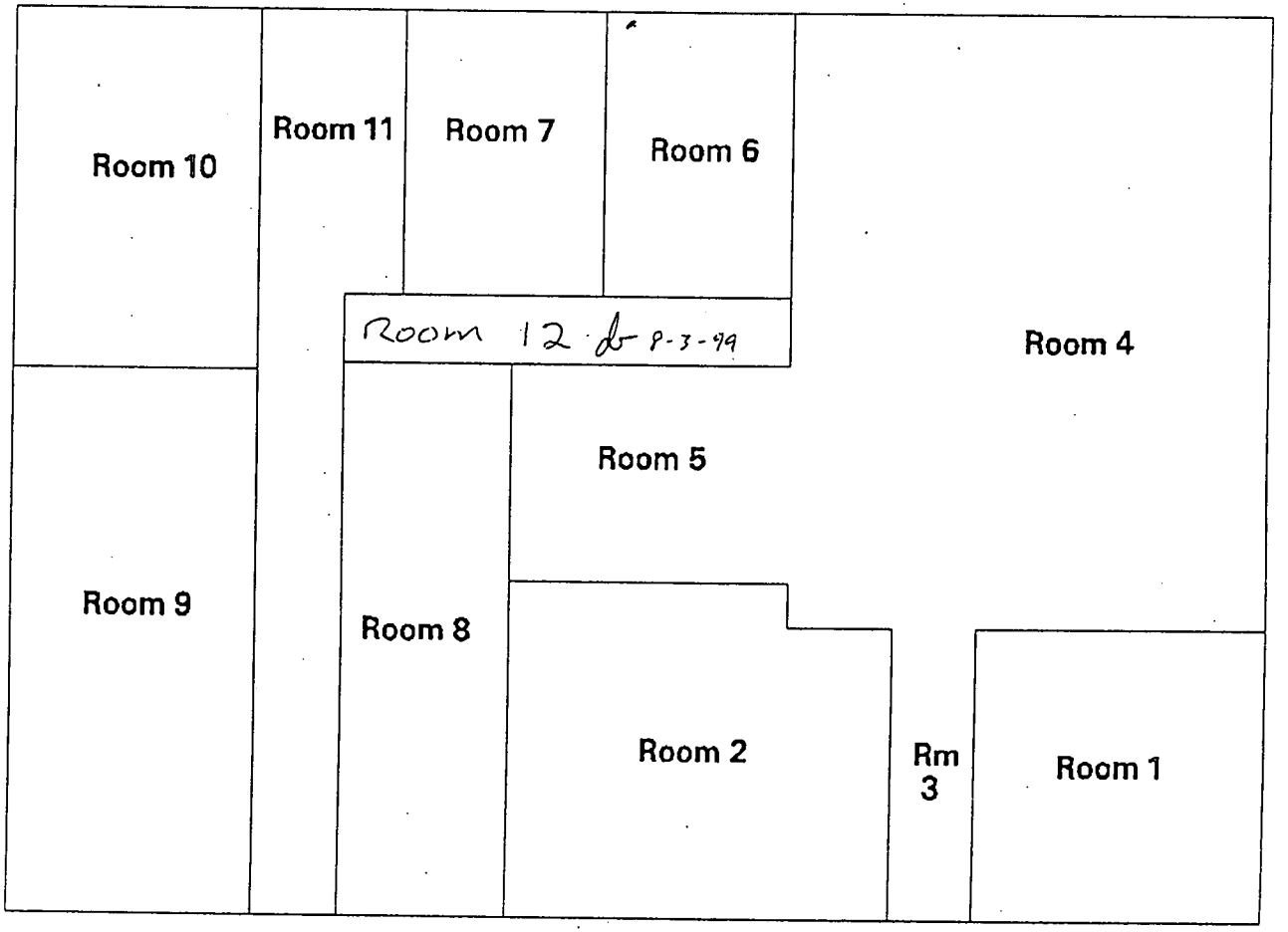
Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

5/23

6/03

afloorplan.xls

Building T112A Floorplan



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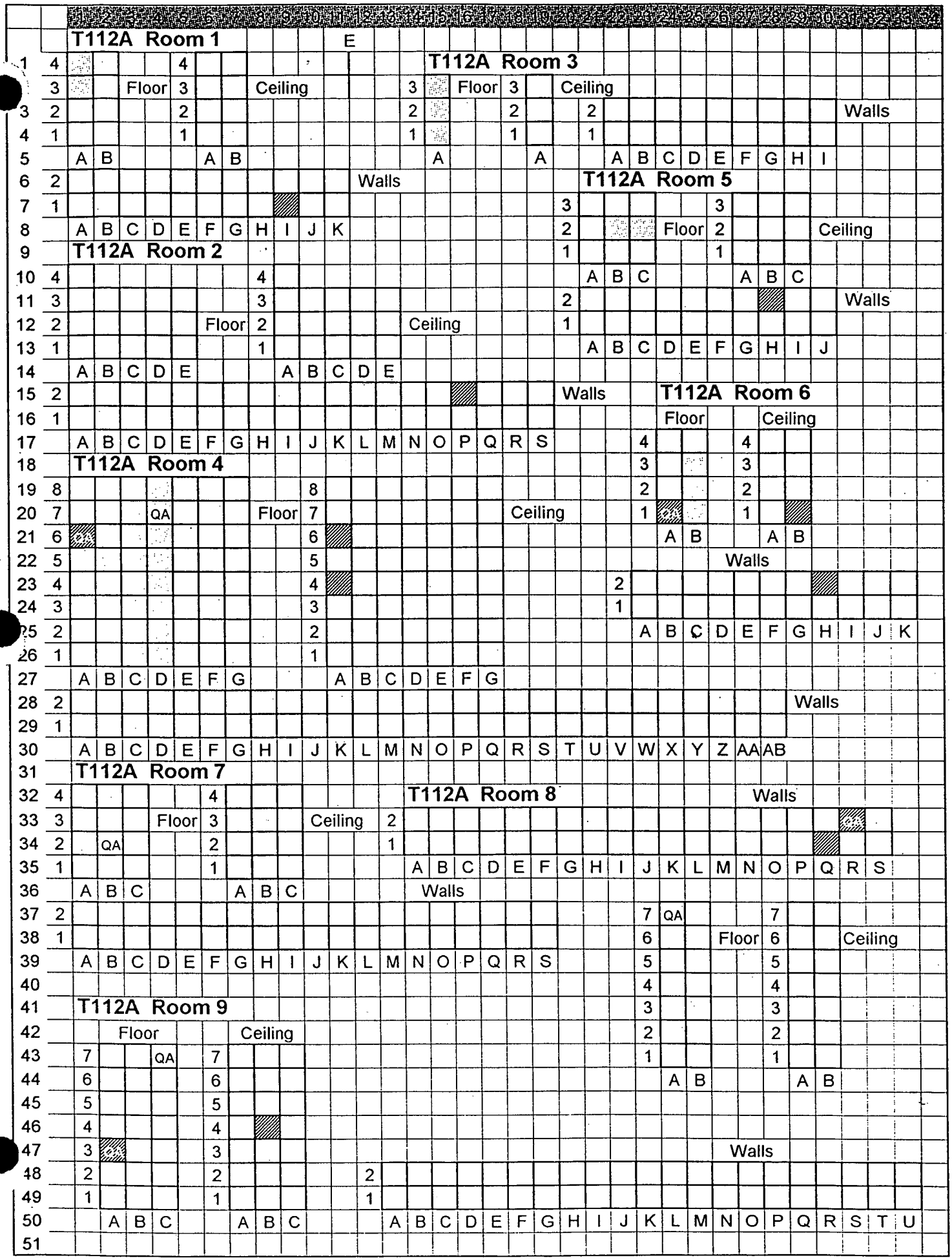
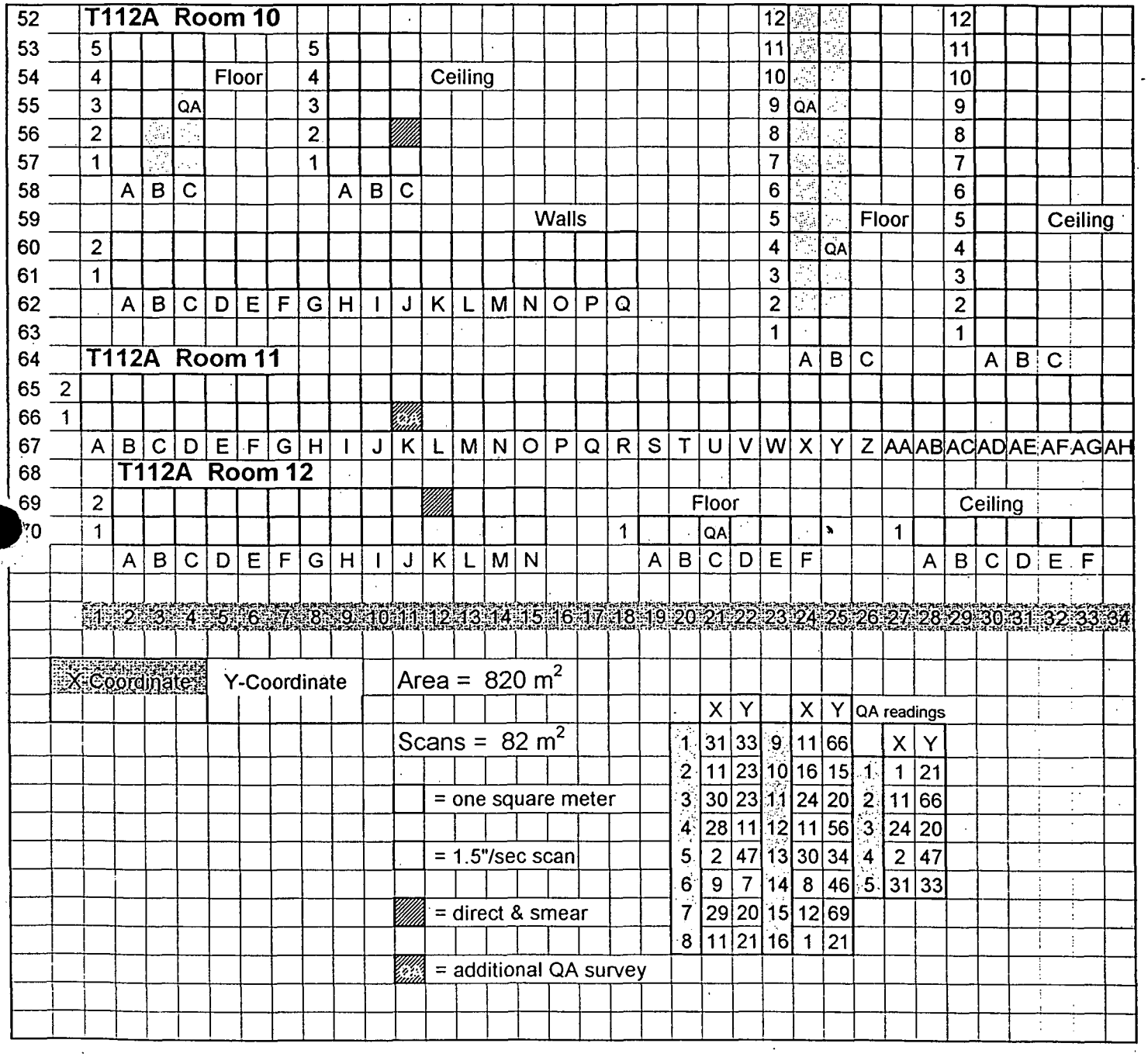

T112A Room 1
T112A Room 3
T112A Room 5
T112A Room 2
T112A Room 6
T112A Room 4
T112A Room 7
T112A Room 8
T112A Room 9
Floor
Ceiling
Walls
QA



	X	Y		X	Y
1	31	33	9	11	66
2	11	23	10	16	15
3	30	23	11	24	20
4	28	11	12	11	56
5	2	47	13	30	34
6	9	7	14	8	46
7	29	20	15	12	69
8	11	21	16	1	21

	X	Y
1	1	21
2	11	66
3	24	20
4	2	47
5	31	33

Appendix 3

Radiological Survey Data for Exterior of Trailer T112A (Survey Unit D)

APPENDIX 3 - Survey Unit D (Exterior T112A)

- Survey Unit D Data Summary
- MARSSIM Calibration/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Map
- Laboratory Radiochemistry Results
- Chain of Custody

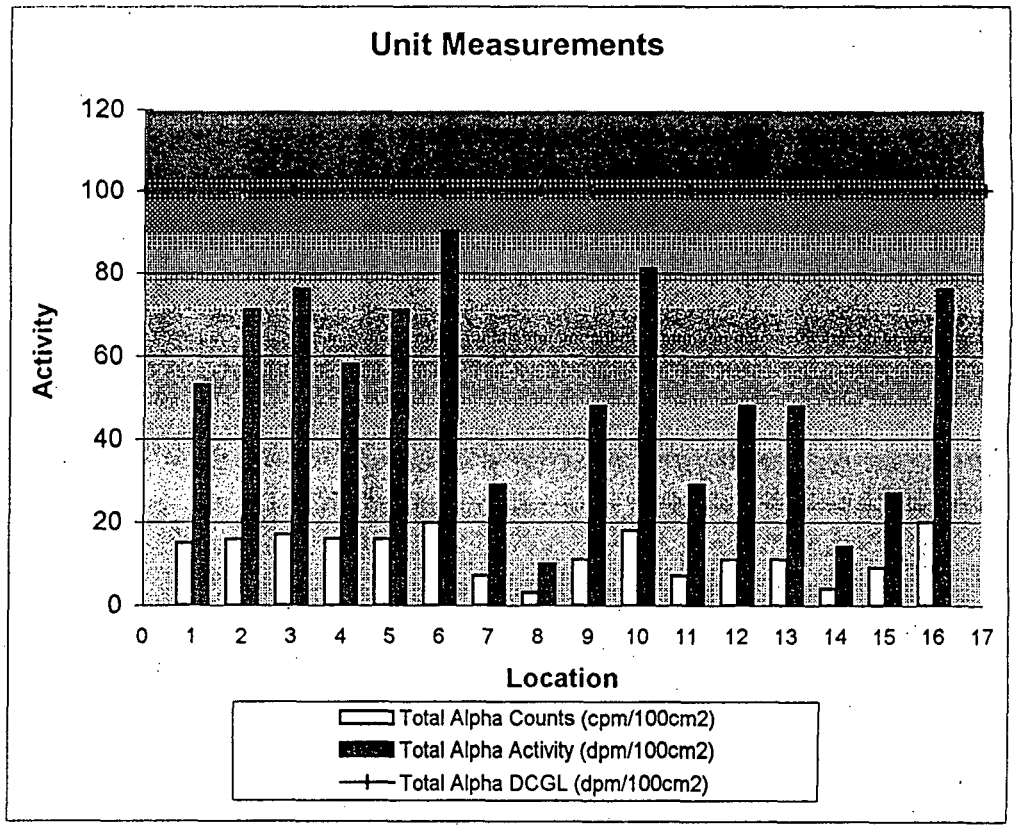
Total Alpha

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

					08/10/99	8/19/99
standard deviation:	24.67717	max:	90.0	Instrument background:	1 cpm	3 cpm
mean:	51.8125	min:	10.0	Instrument efficiency:	21.0 %	22.5 %
median:	50.5			Instrument MDA:	33 dpm	48 dpm

	Surface Location			Grid Location	Total Alpha Counts (cpm/100cm²)	Total Alpha Activity (dpm/100cm²)	Total Alpha DCGL (dpm/100cm²)
1	Exterior		Roof	A2	15	53	100
2	Exterior		Roof	E3	16	71	100
3	Exterior		Roof	E5	17	76	100
4	Exterior		Roof	G3	16	58	100
5	Exterior		Roof	M8	16	71	100
6	Exterior		Roof	N7	20	90	100
7	Exterior	2	Wall	I2	7	29	100
8	Exterior	2	Wall	K3	3	10	100
9	Exterior	2	Wall	O3	11	48	100
10	Exterior	2	Wall	B1	18	81	100
11	Exterior	N	Wall	A1	7	29	100
12	Exterior	N	Wall	D1	11	48	100
13	Exterior	N	Wall	C3	11	48	100
14	Exterior	S	Wall	E3	4	14	100
15	Exterior		Roof	R5	9	27	100
16	Exterior		Roof	A6	20	76	100



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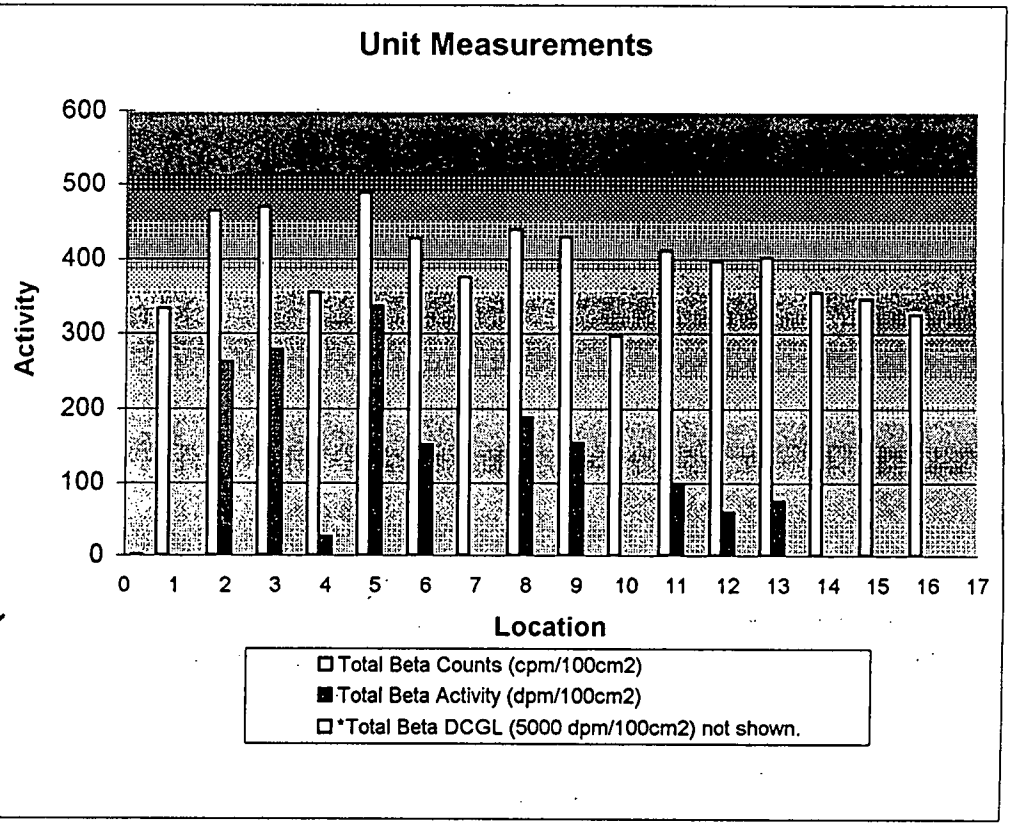
Total Beta

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

					08/10/99	8/19/99
standard deviation:	153.1643	max:	336.0	Instrument background:	379 cpm	346 cpm
mean:	73.3125	min:	-256.0	Instrument efficiency:	32.4 %	30.4 %
median:	66.5			Instrument MDA:	288 dpm	294 dpm

	Surface Location			Grid Location	Total Beta Counts (cpm/100cm^2)	Total Beta Activity (dpm/100cm^2)	Total Beta DCGL (dpm/100cm^2)
1	Exterior		Roof	A2	333	-43	5000
2	Exterior		Roof	E3	464	262	5000
3	Exterior		Roof	E5	469	278	5000
4	Exterior		Roof	G3	354	26	5000
5	Exterior		Roof	M8	488	336	5000
6	Exterior		Roof	N7	428	151	5000
7	Exterior	2	Wall	I2	375	-12	5000
8	Exterior	2	Wall	K3	440	188	5000
9	Exterior	2	Wall	O3	429	154	5000
10	Exterior	2	Wall	B1	296	-256	5000
11	Exterior	N	Wall	A1	411	99	5000
12	Exterior	N	Wall	D1	398	59	5000
13	Exterior	N	Wall	C3	403	74	5000
14	Exterior	S	Wall	E3	355	-74	5000
15	Exterior		Roof	R5	346	0	5000
16	Exterior		Roof	A6	325	-69	5000



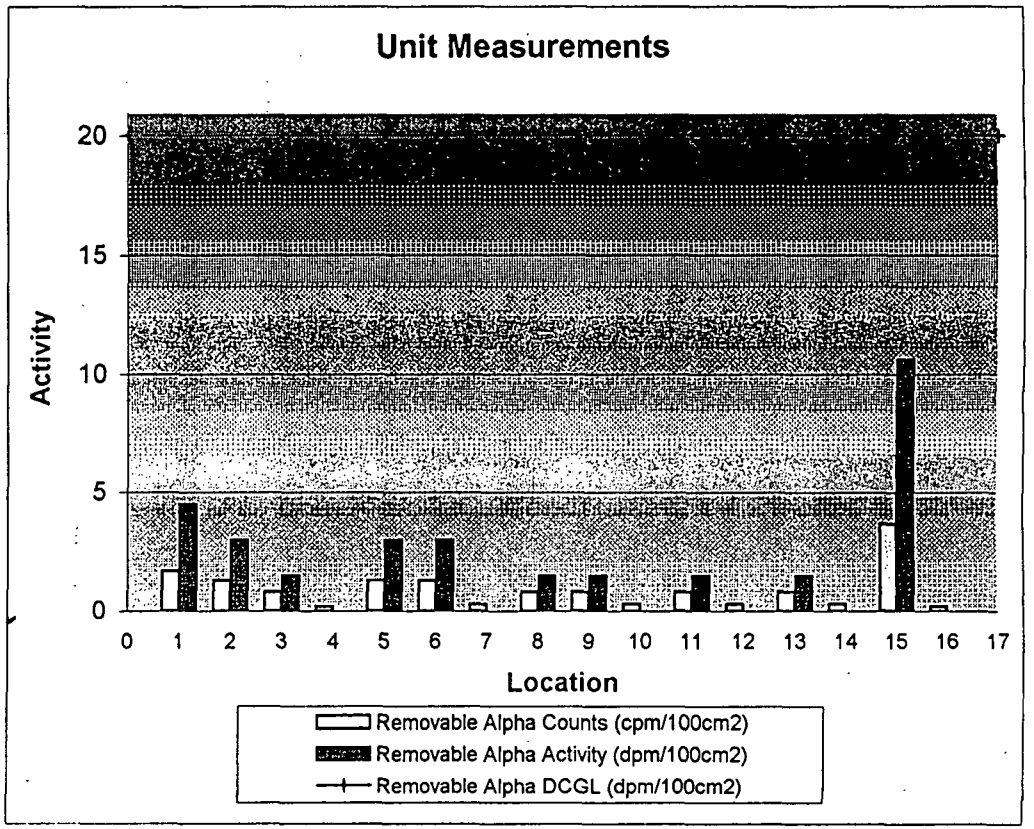
Removable Alpha

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

					08/10/99	8/19/99
standard deviation:	2.688866	max:	10.6	Instrument background:	0.3 cpm	0.2 cpm
mean:	1.975	min:	0.0	Instrument efficiency:	33 %	33 %
median:	1.5			Instrument MDA:	8.3 dpm	7.5 dpm

	Surface Location			Grid Location	Removable Alpha Counts (cpm/100cm^2)	Removable Alpha Activity (dpm/100cm^2)	Removable Alpha DCGL (dpm/100cm^2)
1	Exterior		Roof	A2	2	4.5	20
2	Exterior		Roof	E3	1	3	20
3	Exterior		Roof	E5	1	1.5	20
4	Exterior		Roof	G3	0	0	20
5	Exterior		Roof	M8	1	3	20
6	Exterior		Roof	N7	1	3	20
7	Exterior	2	Wall	I2	0	0	20
8	Exterior	2	Wall	K3	1	1.5	20
9	Exterior	2	Wall	O3	1	1.5	20
10	Exterior	2	Wall	B1	0	0	20
11	Exterior	N	Wall	A1	1	1.5	20
12	Exterior	N	Wall	D1	0	0	20
13	Exterior	N	Wall	C3	1	1.5	20
14	Exterior	S	Wall	E3	0	0	20
15	Exterior		Roof	R5	4	10.6	20
16	Exterior		Roof	A6	0	0	20



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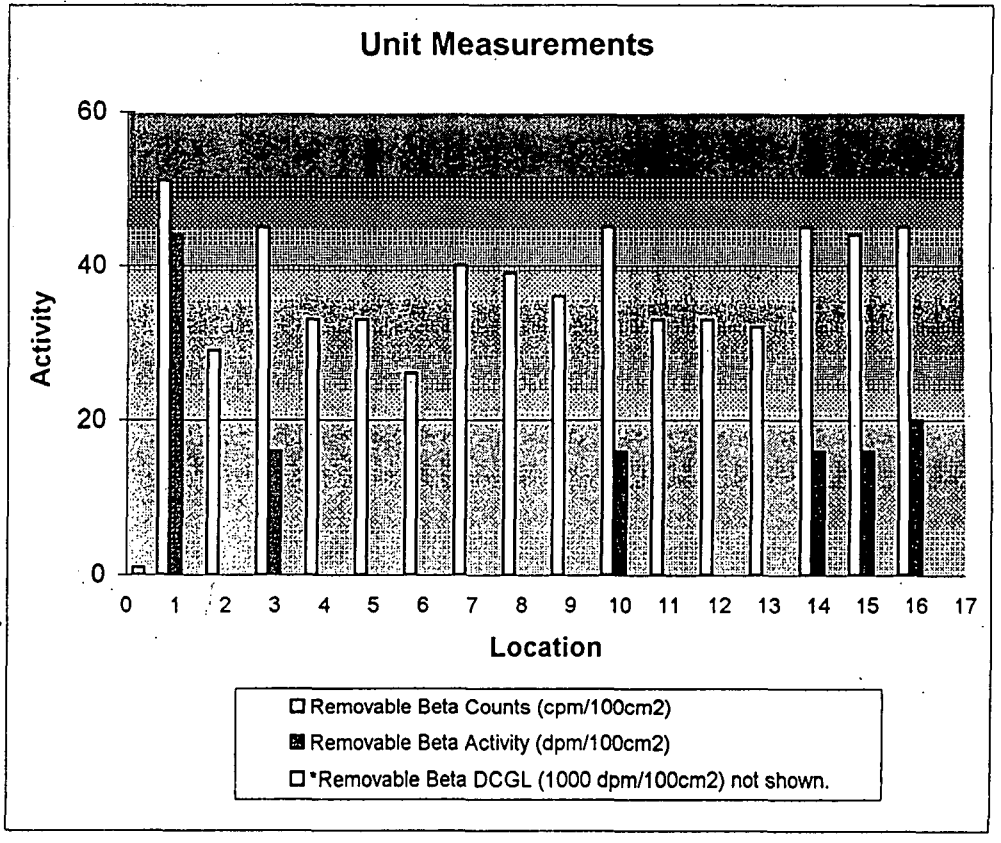
Removable Beta

Survey D Unit Data Summary - T112A Exterior

August 19, 1999

					08/10/99	8/19/99
standard deviation:	29.49237	max:	44.0	Instrument background:	41 cpm	40 cpm
mean:	-10.75	min:	-60.0	Instrument efficiency:	25 %	25 %
median:	-14			Instrument MDA:	200 dpm	200 dpm

	Surface Location			Grid Location	Removable Beta Counts (cpm/100cm²)	Removable Beta Activity (dpm/100cm²)	Removable Beta DCGL (dpm/100cm²)
1	Exterior		Roof	A2	51	44	1000
2	Exterior		Roof	E3	29	-48	1000
3	Exterior		Roof	E5	45	16	1000
4	Exterior		Roof	G3	33	-28	1000
5	Exterior		Roof	M8	33	-32	1000
6	Exterior		Roof	N7	26	-60	1000
7	Exterior	2	Wall	I2	40	-4	1000
8	Exterior	2	Wall	K3	39	-8	1000
9	Exterior	2	Wall	O3	36	-20	1000
10	Exterior	2	Wall	B1	45	16	1000
11	Exterior	N	Wall	A1	33	-32	1000
12	Exterior	N	Wall	D1	33	-32	1000
13	Exterior	N	Wall	C3	32	-36	1000
14	Exterior	S	Wall	E3	45	16	1000
15	Exterior		Roof	R5	44	16	1000
16	Exterior		Roof	A6	45	20	1000



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Survey Area: T112	**Building:** T112A
Survey Unit: D (T112A Exterior)	

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit D removable surface contamination data are calculated on the "Survey Unit D Data" sheet. Because all removable survey measurement results are less than $DCGL_W$ (alpha less than 20 dpm/100 cm^2, beta less than 1000 dpm/100 cm^2), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the $DCGL_W$. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the $DCGL_W$.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit D are: α 2.69 β 26.7

Thus, the ACTUAL required number of measurements is as follows:

α:

$\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/ SD_{REMOVABLE}$

$\Delta/\delta_{transuranics} = (20\ dpm/100cm^2 - 10\ dpm/100cm^2)/ 2.69\ dpm/100cm^2 = 3.7$

β:

$\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/ SD_{REMOVABLE}$

$\Delta/\delta_{transuranics} = (1000\ dpm/100cm^2 - 500\ dpm/100cm^2)/ 26.7\ dpm/100cm^2 = 18.7$

Where:

Δ/δ	is the relative shift or the resolution of measurements in units of measurement uncertainty
$DCGL_{REMOVABLE}$	is the removable surface contamination derived concentration guideline value (DOE Order 5400.5 removable surface contamination limit equals 20 dpm/100cm^2 for transuranics per the T112A-C Pre Demolition Survey Plan)
$LBGR_{REMOVABLE}$	is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to value utilized in original sample size calculation).
$SD_{REMOVABLE}$	is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112	Building: T112A
Survey Unit: D (T112A Exterior)	

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

α

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

β

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

Where:

1.645 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$N = \underline{10.9} * 1.2 = \underline{13}$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 α and β Removable Surface Contamination measurements were required in Unit D.

Step 4:

Draw conclusions from the data: All measurements are less than $DCGL_W$. The minimum number of required removable survey measurements were collected. Thus, survey Unit D complies with the removable contamination release criteria.

D. A. BARNES	[redacted]		8-19-99
Prepared By: Printed Name		Radiological Engineer Signature	Date
H. B. ESTABROOKS			8/19/99
Reviewed By: Printed Name		Radiological Engineer Signature	Date

Survey Area: T112	Building: T112A
Survey Unit: D (T112A Exterior)	

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit D data are calculated on the "Survey Unit D Data" sheet. Because all total surface activity (TSA or TSC) measurement results are less than $DCGL_W$ (less than 100 dpm/100 cm^2) , the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the $DCGL_W$. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the $DCGL_W$.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit D are: α 24.7 β 153

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA})/ SD_{TSA}$$

α

$$\Delta/\delta_{transuranics} = (100 \text{ dpm}/100\text{cm}^2 - 50 \text{ dpm}/100\text{cm}^2)/ 24.7 \text{ dpm}/100\text{cm}^2 = 2.0$$

β

$$\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100\text{cm}^2 - 2500 \text{ dpm}/100\text{cm}^2)/ 153 \text{ dpm}/100\text{cm}^2 = 16.4$$

Where:

Δ/δ	is the relative shift or the resolution of measurements in units of measurement uncertainty
$DCGL_{TSA}$	is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface Activity limit equals 100 dpm/100cm^2 for transuranics and 5000 dpm/100cm^2 for uranium, per the T112A-C Pre Demolition Survey Plan)
$LBGR_{TSA}$	is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to the value utilized in the original sample size calculation).
SD_{TSA}	is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112	Building: T112A
Survey Unit: D (T112A Exterior)	

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following

MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

α and β

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

Where:

1.646 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$N = \underline{10.9} * 1.2 = \underline{13}$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit D.

Step 4:

Draw conclusions from the data: All measurements are less than $DCGL_W$. The minimum number of required TSA measurements were collected. Thus, survey Unit D complies with the TSA release criteria.

D. A. BARNES	[redacted]		8-19-99
Prepared By: Printed Name		Radiological Engineer Signature	Date
E. S. BROOKS			8/19/99
Reviewed By: Printed Name		Radiological Engineer Signature	Date

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.1 cpm	Bkg.	0.0 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	6.5 dpm	MDA	6.5 dpm	MDA	

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	BC-4	Model	BC-4	Model	
Serial#	700	Serial#	770	Serial#	
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	N/A
Bkg.	41 cpm	Bkg.	38 cpm	Bkg.	cpm
Efficiency	25 %	Efficiency	25 %	Efficiency	%
MDA	200 dpm	MDA	200 dpm	MDA	dpm

Survey Type: QA SWIPE SURVEY
Building: T112 A, B & C
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-16-99 Time: 14:00

RCT: Hersey / Hersey
Print name Signature

RCT: Espinoza / Espinoza
Print name Signature

PRL #:

Comments: See individual maps of trailers for survey points

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta	Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A ROOM 4 WALL A6*	<6.5	<200			21					
2	T112A ROOM 6 FLOOR A1*	<6.5	<200			22					
3	T112A ROOM 8 WALL P2*	<6.5	<200			23					
4	T112A ROOM 9 FLOOR A3*	<6.5	<200			24					
5	T112A ROOM 11 WALL K1*	<6.5	<200			25					
6	T112A EXTERIOR WEST WALL B1*	<6.5	<200			26					
7	T112A EXTERIOR NORTH WALL A1*	<6.5	<200			27					
8	T112A EXTERIOR EAST WALL K3*	<6.5	<200			28					
9	T112A EXTERIOR SOUTH WALL E3*	<6.5	<200			29					
10	T112A EXTERIOR ROOF A2*	<6.5	<200			30	N/A				
11	T112B ROOM 1 CEILING B3*	<6.5	<200	N/A		31					
12	T112B ROOM 2 FLOOR H1*	<6.5	<200			32					
13	T112B EXTERIOR SOUTH WALL E2*	<6.5	<200			33					
14	T112B EXTERIOR NORTH WALL L1*	<6.5	<200			34					
15	T112B EXTERIOR ROOF F1*	<6.5	<200			35					
16	T112C ROOM 1 FLOOR C1*	<6.5	<200			36					
17	T112C ROOM 3 WALL J2*	<6.5	<200			37					
18	T112C ROOM 5 WALL H1*	<6.5	<200			38					
19	T112C ROOM 6 FLOOR C1*	<6.5	<200			39					
20	T112C EXTERIOR ROOF M3*	<6.5	<200			40					

ate Reviewed: 8/17/99 RS Supervision: S Engelhard / S Engelhard
Print Name Signature

Rev. 05/98

T112 QA swipe survey MDA

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.2 cpm	Bkg.	0.3 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	7.6 dpm	MDA	8.3 dpm	MDA	

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech		
Model	BC-4	Model	BC-4	Model	Electra		
Serial#	700	Serial#	770	Serial#	1681		
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	11/11/99		
Bkg.	41 cpm	Bkg.	39 cpm	Bkg.	1	379 cpm	
Efficiency	25 %	Efficiency	25 %	Efficiency	21.0	32.4 %	
MDA	200 dpm	MDA	200 dpm	MDA	33	288 dpm	

Survey Type: CONTAMINATION SURVEY
Building: T112A EXTERIOR
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-10-99 Time: 14:30

RCT: Hersey / [signature] (Print name / Signature)

RCT: Espinoza / Espinoza (Print name / Signature)

PRL #:

Comments: All results in scans were approx. equal to background except hi points of each grid noted on page 2. Max ion (<100DPM)

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A EXTERIOR ROOF A2 *	<8.3	<200	(181)	327
2	T112A EXTERIOR ROOF E3	<8.3	<200	71	<288
3	T112A EXTERIOR ROOF E5	<8.3	<200	76	<288
4	T112A EXTERIOR ROOF G3	<8.3	<200	(119)	296
5	T112A EXTERIOR ROOF M8	<8.3	<200	71	336
6	T112A EXTERIOR ROOF N7	<8.3	<200	(90)	<288
7	T112A EXTERIOR EAST WALL I2	<8.3	<200	<33	<288
8	T112A EXTERIOR EAST WALL K3 *	<8.3	<200	<33	<288
9	T112A EXTERIOR EAST WALL O3	<8.3	<200	48	<288
10	T112A EXTERIOR WEST WALL B1 *	<8.3	<200	81	<288
11	T112A EXTERIOR NORTH WALL A1 *	<8.3	<200	<33	<288
12	T112A EXTERIOR NORTH WALL D1	<8.3	<200	48	<288
13	T112A EXTERIOR SOUTH WALL C3	<8.3	<200	48	<288
14	T112A EXTERIOR SOUTH WALL E3 *	<8.3	<200	<33	<288
	N/A				

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#1			(167)	299
QA	#8			<33	<288
QA	#10	N/A		81	<288
QA	#11			33	<288
QA	#14			<33	<288
	N/A				

Date Reviewed: 8-13-99 RS Supervision: W Cooper / [signature] (Print Name / Signature)

COVER SHEET

	removable counts		total counts	
	alpha	beta	alpha	beta
1	2	33	39	485
2	2	29	16	464
3	1	45	17	469
4	1	41	26	475
5	2	33	16	488
6	2	26	20	428
7	0	40	7	375
8	1	39	3	440
9	1	36	11	429
10	0	45	18	296
11	1	33	7	411
12	0	33	11	398
13	1	32	11	403
14	0	45	4	355
15				
16				
17				
18				
19				
20				
21			36	476
22			7	436
23			18	298
24			8	398
25			7	418
26				
27				
28				
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40				

CONFIRMATION ONLY

SCAN HI POINTS

PATS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

7160

Continuation Sheet

SURVEY RESULTS

Swipe #	Location/Description Results in DPM/100CM²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A EXTERIOR EAST WALL C1			67	<288
2	T112A EXTERIOR EAST WALL F1			67	<288
3	T112A EXTERIOR EAST WALL G1			67	691
4	T112A EXTERIOR EAST WALL H1			<33	<288
5	T112A EXTERIOR EAST WALL I1			<33	<288
6	T112A EXTERIOR EAST WALL M1			67	<288
7	T112A EXTERIOR EAST WALL N1			<33	<288
8	T112A EXTERIOR EAST WALL P1			48	<288
9	T112A EXTERIOR WEST WALL B1*			67	<288
10	T112A EXTERIOR WEST WALL C1			48	<288
11	T112A EXTERIOR WEST WALL D1			<33	<288
12	T112A EXTERIOR WEST WALL E1			67	<288
13	T112A EXTERIOR WEST WALL F1			43	<288
14	T112A EXTERIOR WEST WALL G1*			52	<288
15	T112A EXTERIOR WEST WALL H1	N/A		<33	<288
16	T112A EXTERIOR WEST WALL I1			81	<288
17	T112A EXTERIOR WEST WALL J1			67	<288
18	T112A EXTERIOR WEST WALL K1			52	395
19	T112A EXTERIOR WEST WALL L1			(286)	<288
20	T112A EXTERIOR WEST WALL M1			48	<288
21	T112A EXTERIOR WEST WALL N1			<33	688
22	T112A EXTERIOR WEST WALL O1			48	<288
23	T112A EXTERIOR WEST WALL P1			67	<288
24	T112A EXTERIOR ROOF A2*			95	389
25	T112A EXTERIOR ROOF E3			76	<288
26	T112A EXTERIOR ROOF E5			62	<288
27	T112A EXTERIOR ROOF G3			67	<288
28	T112A EXTERIOR ROOF M8			90	<288
29	T112A EXTERIOR ROOF N7			81	<288

N/A

Swipe #	Location/Description Results in DPM/100CM²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#9			<33	<288
QA	#14	N/A		81	<288
QA	#24			<33	<288

90 PAIRED (SCANS)
29 "DEFLECTIONS"
1 > 100 DPM/100CM²
REMEDIATED

N/A

Date Reviewed: 8/13/99 RS Supervision: S Engelhard (Print Name) [redacted] (Signature)

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CPM

CONTINUATION SHEET

	REMOVABLE COUNTS		TOTAL COUNTS	
	ALPHA	BETA	ALPHA	BETA
1			15	296
2			15	331
3			15	603
4			7	411
5			7	392
6			15	439
7			7	320
8			11	401
9			15	305
10			11	326
11			7	296
12			15	412
13			10	448
14			12	396
12			7	440
15			18	421
16			15	350
17			12	507
18			61	296
19			11	412
20			7	602
21			11	313
22			15	405
23			21	505
24			17	455
25			14	465
26			15	457
27			20	442
28			18	468
29				
30				
31				
32				
33				
34				
35				

	REMOVABLE COUNTS		TOTAL COUNTS	
	ALPHA	BETA	ALPHA	BETA
36			4	432
37			18	298
38			7	418
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
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71				

INFORMATION ONLY

RESURVEY

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.1 cpm	Bkg.	0.2 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	6.5 dpm	MDA	7.5 dpm	MDA	

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech		
Model	BC-4	Model	BC-4	Model	Electra		
Serial#	700	Serial#	770	Serial#	1665		
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	9/19/99		
Bkg.	40 cpm	Bkg.	37 cpm	Bkg.	3	346	cpm
Efficiency	25 %	Efficiency	25 %	Efficiency	22.5	30.4	%
MDA	200 dpm	MDA	200 dpm	MDA	48	294	dpm

Survey Type: CONTAMINATION SURVEY

Building: T112 A,B & C

Location: 280 Yard

Purpose: Resurvey per R.E. (MARSSIM Survey)

RWP #: N/A

Date: 08-19-99 Time: 11:00

RCT: Hersey / [signature] / [redacted]
Print name Signature

RCT: N/A / / /
Print name Signature Emp. #

PRL #:

Comments:

Alpha removable was a two minute count.

COPY

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112C ROOF M3	9.1	<200	(93)	<294
2	T112B ROOF J3	<7.5	<200	151	<294
3	T112A ROOF G3	<7.5	<200	(58)	<294
4	T112A ROOF R5	10.6	<200	<48	<294
5	T112A ROOF A2	<7.5	<200	(53)	<294
6	T112A ROOF A6	<7.5	<200	76	<294

N/A

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#1			71	<294
QA	#2			(129)	<294
QA	#3	N/A		<48	<294
QA	#6			62	<294

N/A

te Reviewed: 8/18/99 RS Supervision: S Engelhardt / [signature] / [redacted]
Print Name Signature

Rev. 05/98

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COVER SHEET

ALPHA REMOVABLE VALUES FOR 2 MIN COUNTS

8-24-99

	removable counts		total counts	
	alpha	beta	alpha	beta
1	6	34	24	346
2	2	29	37	389
3	0	33	16	354
4	7	44	9	346
5	3	29	15	333
6	0	45	20	325
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21			19	352
22			32	382
23			13	342
24			17	375
25				
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40				

INFORMATION ONLY

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.			
Model	SAC-4	Model	SAC-4	Model			
Serial#	835	Serial#	824	Serial#			
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A		
Bkg.	0.1 cpm	Bkg.	0.1 cpm	Bkg.			
Efficiency	33 %	Efficiency	33 %	Efficiency			
MDA	6.5 dpm	MDA	6.5 dpm	MDA			
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech		
Model	BC-4	Model	BC-4	Model	Electra		
Serial#	905	Serial#	702	Serial#	1827		
Cal Due	09/30/99	Cal Due	11/20/99	Cal Due	10/27/99		
Bkg.	41 cpm	Bkg.	41 cpm	Bkg.	0	398 cpm	
Efficiency	25 %	Efficiency	25 %	Efficiency	22.3	33.5 %	
MDA	200 dpm	MDA	200 dpm	MDA	33	285 dpm	

Survey Type: CONTAMINATION SURVEY
Building: T112c
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-05-99 Time: 14:30

RCT: Hersey / [redacted]
Print name Signature

RCT: Espinoza / [redacted]
Print name Signature

PRL #:

Comments: All results in scans were approx. equal to background except hi points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112C ROOM 1 FLOOR B4	0.0	36	45	257
2	T112C ROOM 1 FLOOR C2 *	0.0	8	27	281
3	T112C ROOM 1 WALL D1	1.5	-20	9	-6
4	T112C ROOM 1 WALL E2	1.5	-20	22	72
5	T112C ROOM 2 WALL K2	0.0	-16	31	-230
6	T112C ROOM 3 WALL E1	0.0	4	18	-137
7	T112C ROOM 3 WALL J2 *	1.5	-8	9	-334
8	T112C ROOM 3 WALL L1	0.0	40	4	149
9	T112C ROOM 4 WALL E2	0.0	4	31	-361
10	T112C ROOM 5 WALL B2	0.0	8	36	-224
11	T112C ROOM 5 WALL H1 *	1.5	-40	36	-364
12	T112C ROOM 5 WALL I1	1.5	-24	9	-346
13	T112C ROOM 7 FLOOR C1 *	0.0	-16	13	51
14	T112C EXTERIOR NORTH WALL J3	4.5	-24	72	-122
15	T112C EXTERIOR SOUTH WALL G1	1.5	-32	94	-12
16	T112C EXTERIOR ROOF M3 *	0.0	-40	130	113
	N/A				

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#2			9	239
QA	#7			31	-245
QA	#11	N/A		9	-215
QA	#13			9	-9
QA	#16			108	75
	N/A				

Date Reviewed: _____ RS Supervision: _____ / _____ / _____
Print Name Signature Emp. #

COVER SHEET

	removable counts		total counts	
	alpha	beta	alpha	beta
1	0	50	10	484
2	0	43	6	492
3	1	36	2	396
4	1	36	5	422
5	0	37	7	321
6	0	42	4	352
7	1	39	2	286
8	0	51	1	448
9	0	42	7	277
10	0	43	8	323
11	1	31	8	276
12	1	35	2	282
13	0	37	3	415
14	3	35	16	357
15	1	33	21	394
16	0	31	29	436
17				
18				
19				
20				
21			2	478
22			7	316
23			2	326
24			2	395
25			24	423
26				
27				
28				
29				
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40				

ONLY INFORMATION ONLY

SCAN HI POINTS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

Swipe #	Location/Description Results in DPM/100CM^2	Removable		Total		Swipe #	Location/Description Results in DPM/100CM^2	Removable		Total	
		Alpha	Beta	Alpha	Beta			Alpha	Beta	Alpha	Beta
1	T112C SOUTH WALL SCAN C1			67	1218	QA	#5 SCAN			72	346
2	T112C SOUTH WALL SCAN E1			49	352	QA	#12 SCAN	N/A		108	81
3	T112C SOUTH WALL SCAN G1			22	152						
4	T112C SOUTH WALL SCAN I1			40	9						
5	T112C SOUTH WALL SCAN J1 *			81	310						
6	T112C SOUTH WALL SCAN K1	N/A		49	-116						
7	T112C SOUTH WALL SCAN L1			18	39						
8	T112C SOUTH WALL SCAN O1			18	-304						
9	T112C SOUTH WALL SCAN P1			67	-227						
10	T112C SOUTH WALL SCAN N1			18	0						
11	T112C SOUTH WALL SCAN M1			13	-316						
12	T112C ROOF SCAN M3 *			99	81						

N/A

N/A

Date Reviewed: _____ RS Supervision: _____ / _____ / _____

Print Name Signature Emp. #

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CONTINUATION SHEET

	REMOVABLE COUNTS		TOTAL COUNTS	
	ALPHA	BETA	ALPHA	BETA
1			15	806
2			11	516
3			5	449
4			9	401
5			18	502
6			11	359
7			4	411
8			4	296
9			15	322
10			4	398
11			3	292
12			22	425
13				
14				
12				
15				
16				
17				
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32				
33				
34				
35				

	REMOVABLE COUNTS		TOTAL COUNTS	
	ALPHA	BETA	ALPHA	BETA
36			16	514
37			24	425
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
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INFORMATION ONLY

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.				
Model	SAC-4	Model	SAC-4	Model				
Serial#	835	Serial#	824	Serial#				
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A			
Bkg.	0.1 cpm	Bkg.	0.1 cpm	Bkg.				
Efficiency	33 %	Efficiency	33 %	Efficiency				
MDA	6.5 dpm	MDA	6.5 dpm	MDA				
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech			
Model	BC-4	Model	BC-4	Model	Electra			
Serial#	905	Serial#	702	Serial#	1827			
Cal Due	09/30/99	Cal Due	11/20/99	Cal Due	10/27/99			
Bkg.	41 cpm	Bkg.	41 cpm	Bkg.	0	398	cpm	
Efficiency	25 %	Efficiency	25 %	Efficiency	22.3	33.5	%	
MDA	200 dpm	MDA	200 dpm	MDA	33	285	dpm	

Survey Type: CONTAMINATION SURVEY
Building: T112c
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-05-99 Time: 14:30

RCT: Hersey / Hersey
Print name Signature

RCT: Espinoza / Espinoza
Print name Signature

[redacted]

PRL #:

Comments: All results in scans were approx. equal to background except hi points of each grid noted on page 2

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112C ROOM 1 FLOOR B4	<6.5	<200	45	<285
2	T112C ROOM 1 FLOOR C2 *	<6.5	<200	<33	<285
3	T112C ROOM 1 WALL D1	<6.5	<200	<33	<285
4	T112C ROOM 1 WALL E2	<6.5	<200	<33	<285
5	T112C ROOM 2 WALL K2	<6.5	<200	<33	<285
6	T112C ROOM 3 WALL E1	<6.5	<200	<33	<285
7	T112C ROOM 3 WALL J2 *	<6.5	<200	<33	<285
8	T112C ROOM 3 WALL L1	<6.5	<200	<33	<285
9	T112C ROOM 4 WALL E2	<6.5	<200	<33	<285
10	T112C ROOM 5 WALL B2	<6.5	<200	36	<285
11	T112C ROOM 5 WALL H1 *	<6.5	<200	36	<285
12	T112C ROOM 5 WALL I1	<6.5	<200	<33	<285
13	T112C ROOM 7 FLOOR C1 *	<6.5	<200	<33	<285
14	T112C EXTERIOR NORTH WALL J3	<6.5	<200	72	<285
15	T112C EXTERIOR SOUTH WALL G1	<6.5	<200	94	<285
16	T112C EXTERIOR ROOF M3 *	<6.5	<200	130	<285
	N/A				

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#2			<33	<285
QA	#7			<33	<285
QA	#11	N/A		<33	<285
QA	#13			<33	<285
QA	#16			108	<285
	N/A				

Date Reviewed: 8/13/99 RS Supervision: S Engelhad / [signature]
Print Name Signature

[redacted]

SCAN HI POINTS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

Continuation Sheet

SURVEY RESULTS

Swipe #	Location/Description Results in DPM/100CM²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112C SOUTH WALL SCAN C1			67	1218
2	T112C SOUTH WALL SCAN E1			49	352
3	T112C SOUTH WALL SCAN G1			<33	<285
4	T112C SOUTH WALL SCAN I1			40	<285
5	T112C SOUTH WALL SCAN J1 *			81	310
6	T112C SOUTH WALL SCAN K1	N/A		49	<285
7	T112C SOUTH WALL SCAN L1			<33	<285
8	T112C SOUTH WALL SCAN O1			<33	<285
9	T112C SOUTH WALL SCAN P1			67	<285
10	T112C SOUTH WALL SCAN N1			<33	<285
11	T112C SOUTH WALL SCAN M1			<33	<285
12	T112C ROOF SCAN M3 *			99	<285
	N/A				

Swipe #	Location/Description Results in DPM/100CM²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#5 SCAN			72	346
QA	#12 SCAN	N/A		108	<285
	N/A				

Date Reviewed: 8/13/99 RS Supervision: S Engelhard [signature] [redacted]

Print Name Signature

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Electra Performance Test Log

Instrument Serial Number: 1682

Instrument Efficiency Alpha: 22.2% Beta: 30.1%

Instrument Calibration Due Date: 2-4-00

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Accl. (cpm)	Source Acceptable Range (sq)
680141 α	N/A	24830	5512	4410 to 6615
603927 β	N/A	22723	6840	5472 to 8208
				to
				to
				to
				to
				to

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
8/5/99	0	4950	Pass	486	6555	Pass	[redacted]	Munoz	
8/10/99	1	5010	Pass	526	6008	Pass		G. Hosenkamp	
8/11/99	2	5110	Pass	481	6392	Pass		G. Hosenkamp	
8/12/99	2	5170	Pass	502	7173	Pass		G Hosenkamp	
8/13/99	2	4950	Pass	507	6987	Pass		G Hosenkamp	
8/16/99	2	4940	Pass	437	6684	Pass		Munoz	
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REVIEWED BY: L N Cooper
RO SUPERVISOR PRINT NAME

RO SUPERVISOR SIGNATURE DATE 8-17-99

NOTE: If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

COPY

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

Mfg. SAIC	Mfg.	Mfg.
Model AP-2	Model	Model
Serial# A146	Serial#	Serial#
Cal Due Oct-99	Cal Due	Cal Due
Bkg. N/A	Bkg.	Bkg.
Efficiency N/A	Efficiency	Efficiency
MDA N/A	MDA	MDA
Mfg.	Mfg.	Mfg.
Model	Model	Model
Serial#	Serial#	Serial#
Cal Due	Cal Due	Cal Due
Bkg.	Bkg.	Bkg.
Efficiency	Efficiency	Efficiency
MDA	MDA	MDA

Survey Type: Alpha Spectroscopy
Building: T112A
Location: Metal Roof
Purpose: RSP/RF RCM Compliance

RWP #: N/A

Date: 07/20/99 **Time:** Day

RCT: R. E. Read / Signature
Print name

RCT: N/A / N/A
Print name Signature

[redacted]

PRL #:

Comments: Both Count Times were 60 mins. In both cases detector columnator was approx. 1/16th to 1/8th in. abvove sample surface, which might skew spectrum to the left.

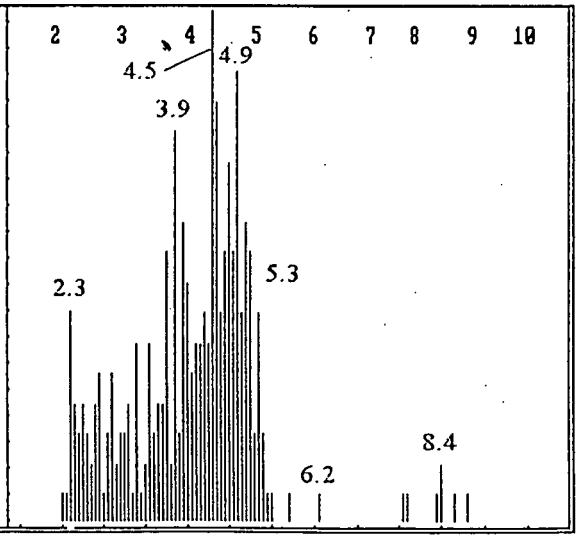
SURVEY RESULTS

990720.SPE MEV>
REC# 3 OF 3

MIN: 0
MAX: 17
RANGE: 17
SCALE:MIN to MAX
Cursor MEV: 2.3
COUNT: 7
Pu239 Cts: 91
Radon Ctc: 8
Gross Cts: 290

AP-2 SN# A146

Item Description: Metal roof on T112A, Location# 2

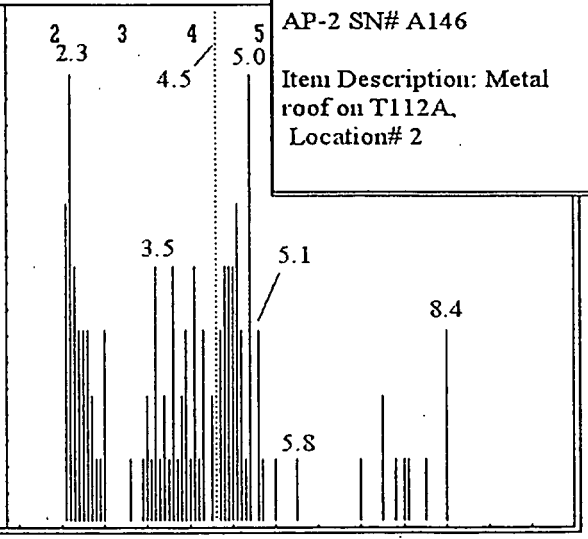


990720.SPE MEV>
REC# 2 OF 3

MIN: 0
MAX: 8
RANGE: 8
SCALE:MIN to MAX
Cursor MEV: 4.5
COUNT: 8
Pu239 Cts: 32
Radon Cts: 11
Gross Cts: 121

AP-2 SN# A146

Item Description: Metal roof on T112A
Location# 1



Date Reviewed: 7-21-99 **RS Supervision:** L.N Cooper / L Cooper
Print Name Signature

7-21-99 D.A. BARNES / D A B

[redacted]

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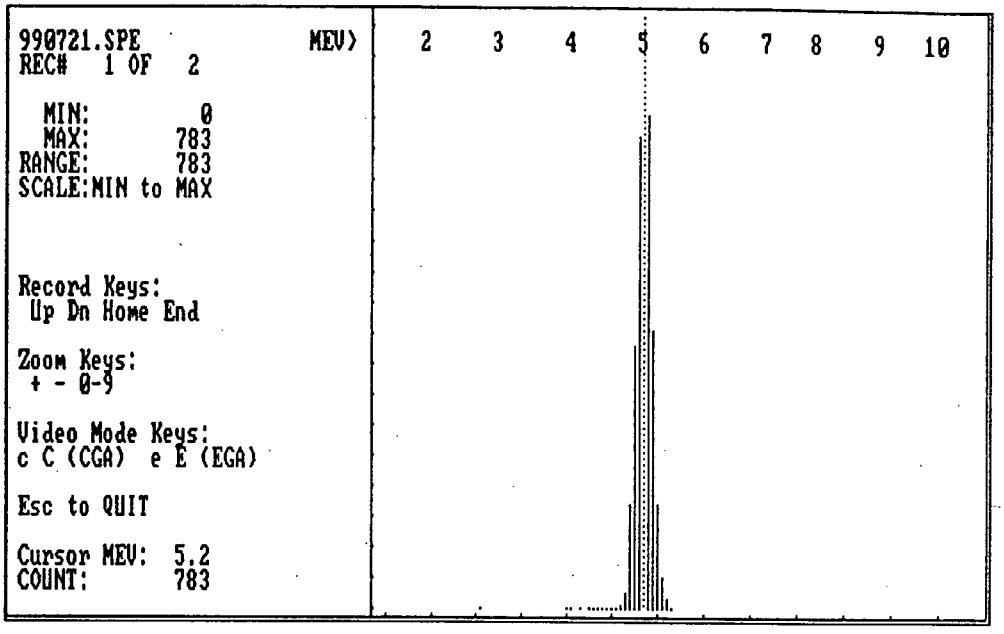
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

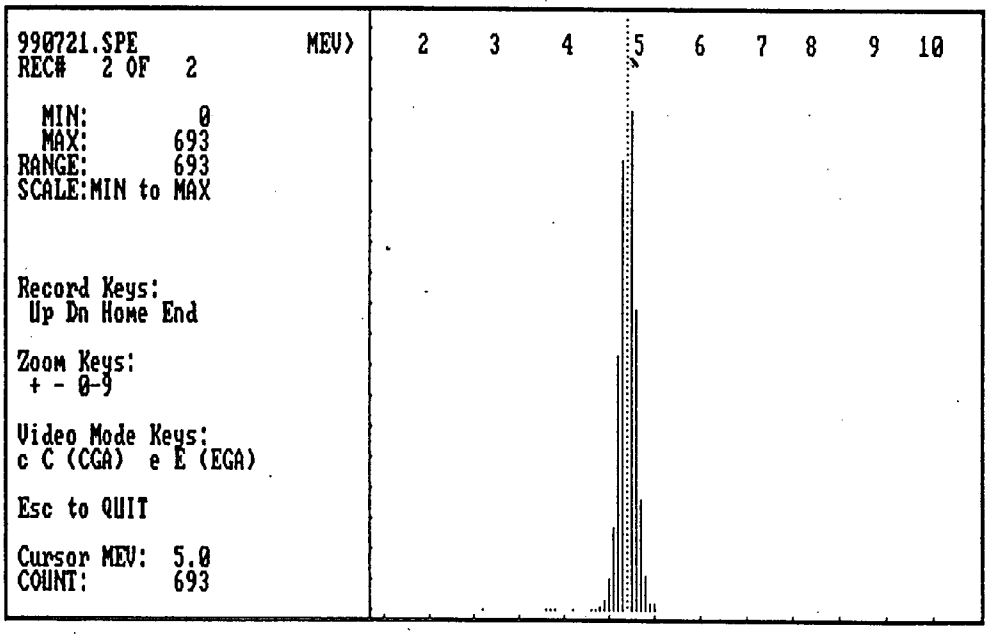
RADIOLOGICAL SAFETY

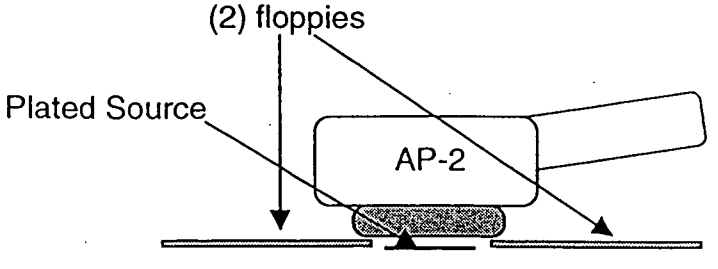
Drawing Showing Survey Points

This spectrum was taken with probe directly on the surface of the plated source.



This spectrum was taken with probe approx. 1/8th in above surface of the same source.





ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

Mfg. EBERLINE	Mfg. EBERLINE	Mfg. NE
Model SAC-4	Model SAC-4	Model ELECTRA
Serial# 861	Serial# 842	Serial# 1665
Cal Due 12/7/99	Cal Due 12/9/99	Cal Due 9/19/99
Bkg. 0	Bkg. 0	Bkg. 1 / 556
Efficiency 0.33	Efficiency 0.33	Efficiency .225 / .299
MDA <20	MDA <20	MDA 33 / 361
Mfg. EBERLINE	Mfg. EBERLINE	Mfg.
Model BC-4	Model BC-4	Model
Serial# 704	Serial# 702	Serial#
Cal Due 9/25/99	Cal Due 11/20/99	Cal Due
Bkg. 35	Bkg. 40	Bkg.
Efficiency 0.25	Efficiency 0.25	Efficiency
MDA <200	MDA <200	MDA

Survey Type: CONTAMINATION
Building: T-112 A
Location: Roof
Purpose: Pre-Job Survey

RWP #: N/A

Date: 07/20/99 Time: 1300

RCT: S. Jablkowski / S. Jablkowski [redacted]
Print name Signature

RCT: / /
Print name Signature Emp. #

PRL #:

Comments: Pre-Job survey on roof for drilling sample.
(SEE MAP) TOTAL ALPHA READINGS are ONE MINUTE PATs.

SURVEY RESULTS Map

Swipe	Location/Description Results in DPM/100sq cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta	Swipe #	Location/Description Results in DPM/100sq cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	See Map	<20	<200	186	<361						
2	↓	<20	<200	144	<361						
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

7-20-99

COPY

e Reviewed: 7-21-99 RS Supervision: LN Cooper / LN Cooper [redacted]
Print Name Signature Emp. #

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

Mfg. EBERLINE	Mfg. EBERLINE	Mfg. NE
Model SAC-4	Model SAC-4	Model ELECTRA
Serial# 861	Serial# 842	Serial# 1425
Cal Due 12/7/99	Cal Due 12/9/99	Cal Due 8/25/99
Bkg. 0.3	Bkg. 0	Bkg. 2 / 548
Efficiency 0.33	Efficiency 0.33	Efficiency .21 / .316
MDA <20	MDA <20	MDA 44 / 366
Mfg. EBERLINE	Mfg. EBERLINE	Mfg.
Model BC-4	Model BC-4	Model
Serial# 704	Serial# 702	Serial#
Cal Due 9/25/99	Cal Due 11/20/99	Cal Due
Bkg. 36	Bkg. 43	Bkg.
Efficiency 0.25	Efficiency 0.25	Efficiency
MDA <200	MDA <200	MDA

Survey Type: CONTAMINATION
Building: T-112 A
Location: Roof
Purpose: Post-Job Survey

RWP #: N/A

Date: 07/21/99 Time: 1500

RCT: S. Jablkowski / [signature] / [redacted]
Print name Signature

RCT: N/A / / /
Print name Signature Emp. #

PRL #: N/A

Comments: Post-Job survey on roof for sampling.
(SEE MAP)

SURVEY RESULTS Map

Swipe	Location/Description Results in DPM/100sq cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta	Swipe #	Location/Description Results in DPM/100sq cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	See Map	<20	<200	102	<366						
2		<20	<200	24	<366						
3		<20	<200	12	<366						
4		<20	<200	114	<366						
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

7.21.99

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:e Reviewed: 7/21/99 RS Supervision: S Engelhard / [signature] / [redacted]
Print Name Signature

Rev. 05/98

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

	SAIC	Mfg.	Mfg.
Model	AP-2	Model	Model
Serial#	A146	Serial#	Serial#
Cal Due	Oct-99	Cal Due	Cal Due
Bkg.	N/A	Bkg.	Bkg.
Efficiency	N/A	Efficiency	Efficiency
MDA	N/A	MDA	MDA
Mfg.		Mfg.	Mfg.
Model		Model	Model
Serial#		Serial#	Serial#
Cal Due		Cal Due	Cal Due
Bkg.		Bkg.	Bkg.
Efficiency		Efficiency	Efficiency
MDA		MDA	MDA

Survey Type: Alpha Spectroscopy
Building: T112A
Location: Metal Roof
Purpose: RSP/RF RCM Compliance

RWP #: N/A
Date: 07/20/99 Time: Day
RCT: R. E. Read / [signature] / [redacted]
Print name / Signature

RCT: N/A / N/A / N/A
Print name / Signature / Emp. #

PRL #:
Comments: Both Count Times were 60 mins. In both cases detector columnator was approx. 1/16th to 1/8th in. abvove sample surface, which might skew spectrum to the left.

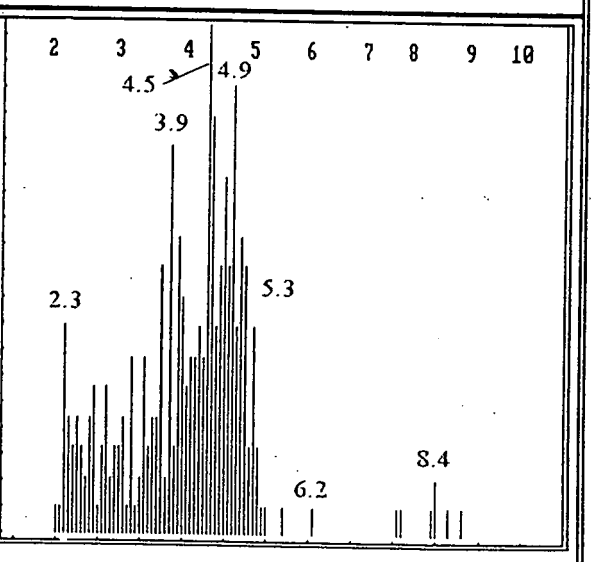
SURVEY RESULTS

990720.SPE MEV>
REC# 3 OF 3

MIN: 0
MAX: 17
RANGE: 17
SCALE:MIN to MAX
Cursor MEV: 2.3
COUNT: 7
Pu239 Cts: 91
Radon Ctc: 8
Gross Cts: 290

AP-2 SN# A146

Item Description: Metal roof on T112A, Location# 2

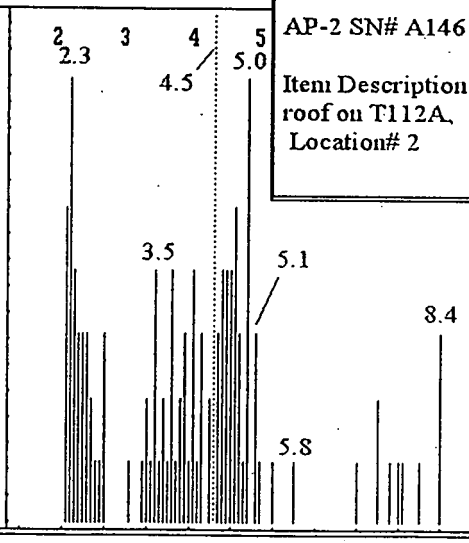


990720.SPE MEV>
REC# 2 OF 3

MIN: 0
MAX: 8
RANGE: 8
SCALE:MIN to MAX
Cursor MEV: 4.5
COUNT: 8
Pu239 Cts: 32
Radon Cts: 11
Gross Cts: 121

AP-2 SN# A146

Item Description: Metal roof on T112A Location# 1



Reviewed: 7-21-99 RS Supervision: L N Cooper / [signature] [redacted]
Print Name / Signature

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

Mfg. EBERLINE	Mfg. EBERLINE	Mfg. NE
Model SAC-4	Model SAC-4	Model ELECTRA
Serial# 861	Serial# 842	Serial# 1425
Cal Due 12/7/99	Cal Due 12/9/99	Cal Due 8/25/99
Bkg. 0.3	Bkg. 0	Bkg. 2 / 548
Efficiency 0.33	Efficiency 0.33	Efficiency .21 / .316
MDA <20	MDA <20	MDA 44 / 366
Mfg. EBERLINE	Mfg. EBERLINE	Mfg.
Model BC-4	Model BC-4	Model
Serial# 704	Serial# 702	Serial#
Cal Due 9/25/99	Cal Due 11/20/99	Cal Due
Bkg. 36	Bkg. 43	Bkg.
Efficiency 0.25	Efficiency 0.25	Efficiency
MDA <200	MDA <200	MDA

Survey Type: CONTAMINATION
Building: T-112 A & B
Location:
Purpose: Unrestricted Release

RWP #: N/A

Date: 07/21/99 Time: 1445

RCT: S. Jablkowski / [signature] / [redacted]
Print name Signature

RCT: / /
Print name Signature Emp. #

PRL #: 99-549-169

Comments: (8) Sampling bottles, #99A8967-001.001 ,001.002, 002.001, 002.002, 003.001, 003.002, 004.001, 004.002
(SEE MAP)

SURVEY RESULTS

Map

	Location/Description Results in DPM/100sq cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta	Swipe #	Location/Description Results in DPM/100sq cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	See Map	<20	<200	<44	<366						
2		<20	<200	<44	<366						
3		<20	<200	<44	<366						
4		<20	<200	<44	<366						
5		<20	<200	<44	<366						
6		<20	<200	<44	<366						
7		<20	<200	<44	<366						
8		<20	<200	<44	<366						
9											
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18											
19											
20											

COPY

7-21-99

7-21-99

Reviewed: 7-21-99 RS Supervision: LN Cooper / [signature] / [redacted]
Print Name Signature

100

Survey Area: T112	Survey Unit: Unit D	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for implementation.

D. A. BARNES	[redacted]		8-3-99
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
H. B. ESTABROOKS			8/3/99
RE Peer Review Printed Name		RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

D. A. BARNES	[redacted]		8-19-99
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
ES ESTABROOKS			8/19/99
RE Manager Printed Name		RE Manager Signature	Date

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17/23

Survey Area: T112	Survey Unit: Unit C	Building: T112C
Survey Unit Description: Office trailer – Pre Demolition Survey		

SAMPLING AND SURVEY INSTRUCTIONS

Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

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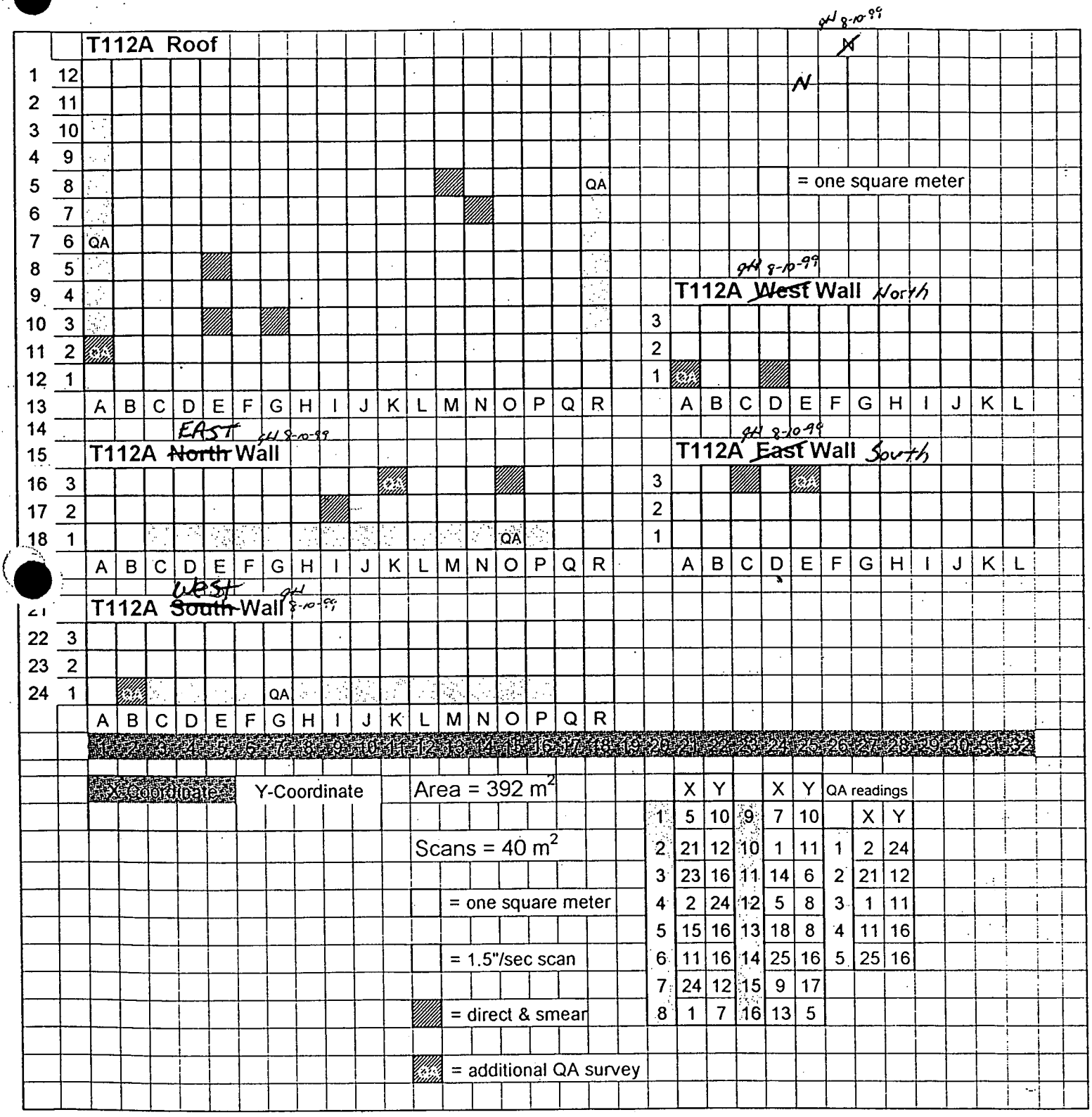
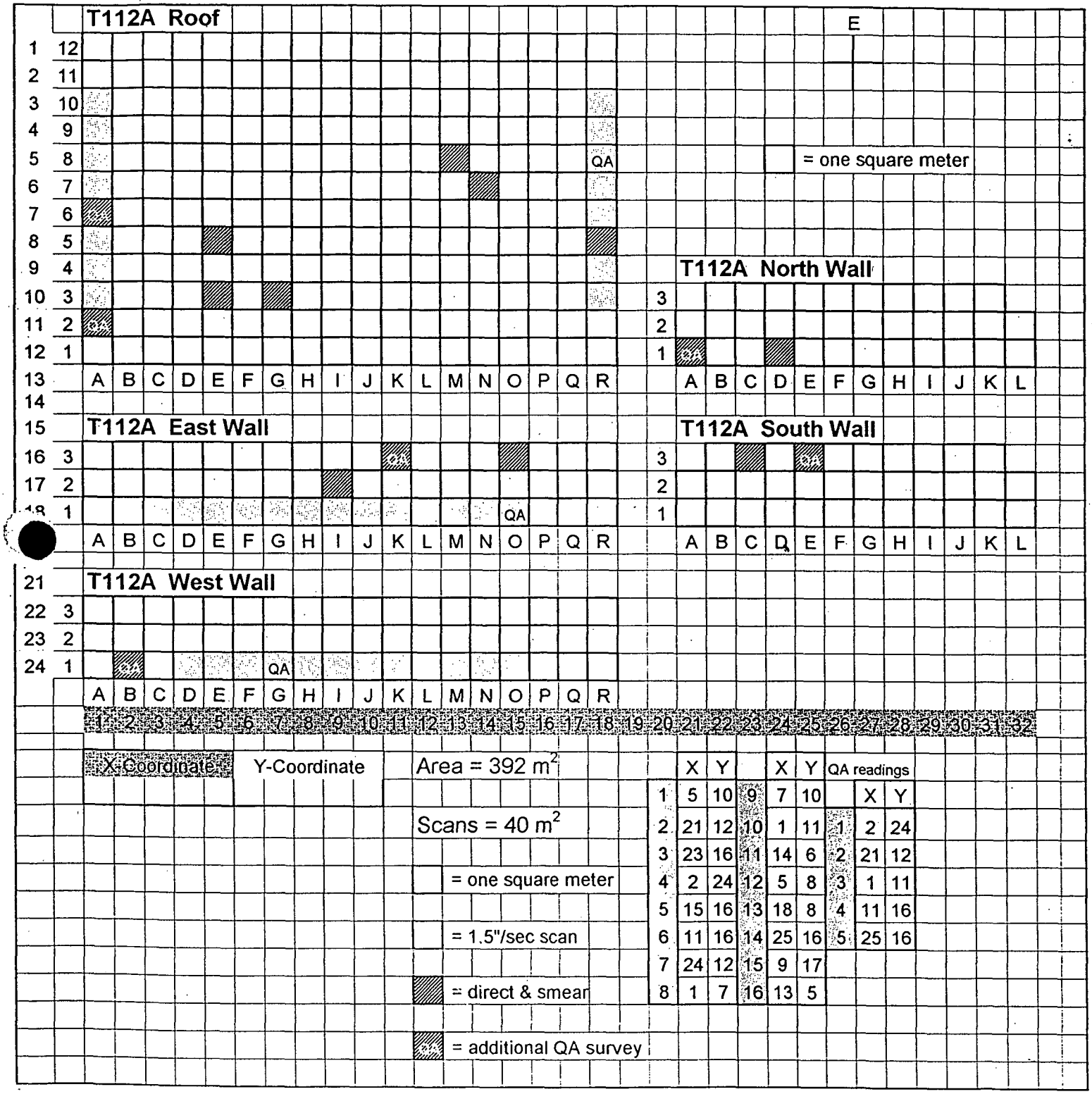
14/23



	X	Y		X	Y
1	5	10	9	7	10
2	21	12	10	1	11
3	23	16	11	14	6
4	2	24	12	5	8
5	15	16	13	18	8
6	11	16	14	25	16
7	24	12	15	9	17
8	1	7	16	13	5

QA readings		
	X	Y
1	2	24
2	21	12
3	1	11
4	11	16
5	25	16



	X	Y		X	Y	QA readings	X	Y
1	5	10	9	7	10			
2	21	12	10	1	11	1	2	24
3	23	16	11	14	6	2	21	12
4	2	24	12	5	8	3	1	11
5	15	16	13	18	8	4	11	16
6	11	16	14	25	16	5	25	16
7	24	12	15	9	17			
8	1	7	16	13	5			

Safe Sites
OF COLORADO
Rocky Flats Environmental Technology Site

Post-It® Fax Note 7671	Date 7/26	# of pages ▶ 2
To Dave Barnes	From Barraso	
Co./Dept.	Co.	
Phone #	Phone # 8451	
Fax # 8048	Fax # 8027	

September 23, 1997

Alan Parker
Vice President
Closure Projects Int.
Kaiser-Hill, L. L. C.

RADIOLOGICAL REQUIREMENTS FOR RELEASE OF THE 690 AND 891 TRAILER CLUSTERS - DJH–028–97

At your request, Radiological Engineering is documenting the series of events that have taken place with the radiological surveys and laboratory analysis performed on the 690 Trailer cluster as well as the 891 trailers. Based on the following information, Radiological Engineering will proceed with Property/Waste Release Evaluations (P/WRE) for the unrestricted release of the 690 Trailer cluster and the 891 Trailer cluster. (The 690 trailer cluster is composed of trailers T690 A, B, C, D, E, F, G, H, I, J, K, L, M, T371G and T444A, and the 891 trailer cluster includes trailers T891 A, L, M, N and T900E.)

Starting in early summer, Radiological Engineering approved survey plans to survey the interior of the 690 Trailer Cluster and the 891 trailer cluster. The survey frequency was based on guidance from NUREG 5849, "Manual for Conducting Radiological Surveys in Support of License Termination" and the guidance in MARSSIM, "Multi-Agency Radiation Survey and Site Investigation Manual". Based on process history, surveys were only required on the Trailer interiors and on certain exterior equipment including the T690K exhaust ducting.

In August, 1997, an RCT performed surveys on the T690K exhaust ducting and found no fixed or removable contamination above the release limits. After the RCT performed the duct survey, he placed his survey instrument on an exterior rusted metal support and noticed elevated alpha activity. This led to additional exterior surveys which also detected elevated alpha activity averaging around 200 dpm/100cm^2 fixed with no removable which would be above the unrestricted release criteria assuming the alpha activity was from transuranics (e.g. plutonium).

At this point Radiological Safety characterized this elevated area with a hand held alpha analyzer (SAIC Model AP-2) to determine the isotope. The spectrum revealed a predominant peak in the 5 MeV energy range which is indicative of plutonium. Additional characterization surveys of the 690 trailers with the AP-2 also indicated plutonium. This led to additional surveys of both the 690 and 891 trailers which all had elevated alpha activity with the roofs and rusted horizontal areas having the most activity. Radiological Safety then launched an extensive effort to bound the size of the elevated alpha activity measurements across the site. Elevated readings were measured on the roofs of the 891 trailers. Days later, surveys on a cargo container near T130B revealed elevated alpha activity in the 200 dpm/100cm^2 range.

Given the wide spread nature of this phenomena, and the fact that it just didn't make sense that the origin of this elevated activity could be from Rocky Flats activities, metal roof samples were taken from the 690 trailers and sent to the B559 labs and B881 labs on-site and to an offsite lab in Charleston, South Carolina. Attached are the results from these laboratories. The final conclusions from all of the labs is that the

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radioactivity on the roofing material was from naturally occurring radioisotopes. The attached laboratory results document this conclusion. The energy level of some of the naturally occurring isotopes is very close to that for plutonium-239 (^{239}Pu); for example Polonium-210 (^{210}Po) has an alpha energy of 5.3 MeV and the alpha energy for ^{239}Pu is 5.1 MeV. With the AP-2 it is evidently very difficult to discriminate between ^{239}Pu and ^{210}Po. The laboratory analysis process, in contrast to the AP-2 field acquisition, is performed in a controlled laboratory environment, has a much higher degree of resolution and therefore allows the lab to make this discrimination.

Based on the laboratory data, the isotopes are not uranium, plutonium or americium. The laboratory results indicate that the source of this activity is from isotopes found in naturally occurring decay chains. Many of the isotopes are short lived, and the total activity is below release criteria. Therefore, Radiological Engineering will proceed with the issuance of the P/WREs which will provide the final authorization to release the trailers. The interior of the 690 and 891 trailers, however, are still required to be surveyed in accordance with the original decommissioning survey plans. This laboratory data also supports the original Radiological Engineering determination that the 690 trailer exteriors could be free released without radiological surveys based on process history. This same process history applies to the 891 trailer exteriors which, based on their age, location and usage, can be free released without exterior surveys. It should also be noted that not all trailers and buildings fall into the category of "no surveys required" for the exterior. Each trailer/building is evaluated on a case by case basis.

Based on all of these recent findings, Radiological Engineering developed a corrective action plan for future AP-2 usage. Radiological Engineering suspended the use of the AP-2 on 9/18/97 and briefed the Radiological Engineering department on the recent AP-2 findings as the first step of this corrective action plan. This action is necessary to prevent further field misinterpretation of AP-2 readings. The action plan also requires a revision to the AP-2 procedure and requires review of the Job Performance Measures (JPM) in the AP-2 training package for evaluating and approving AP-2 results. The AP-2 will not be re-authorized for use until the conditions in the action plan are met. In addition, Radiological Engineering will continue to investigate the mechanism that is causing this elevated activity to deposit on the trailers.

Please contact Jeff Barroso at Extension 8451 if you have any additional questions.

D. Harward

Don Harward
Division Manager
Radiological Safety

JBB:llm

Attachment:
As Stated

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RFP-1329.02 (REV. 3/98)
Previously RF-46522

CORRES. CONTROL
INCOMING LTR NO.
02629 RF 98

DUE DATE
ACTION

24 APR 98 12:31 RFETS-CC

States Government

Memorandum

Department of Energy
Rocky Flats Field Office
APR 1998
RECEIVED

APR 23 1998

AME:TAD:PPP:02637

Application of Surface Contamination Guidelines from DOE Order 5400.5

Wynn A. Harding, Vice President
Safety Systems and Engineering
Kaiser-Hill Company, L.L.C.

Reference: Ltr, Harding to Lowe, 98-RF-00974, subject: same, dtd 3/10/98

The Kaiser-Hill Company, L.L.C. (Kaiser-Hill) requested approval of the interpretations for surface contamination as set forth in the reference above. The Rocky Flats Field Office concurs with your interpretation because the conservative nature of the proposed approach is consistent with the guidelines specified in the Final Multi-Agency Radiation Survey and Site Investigation Manual.

David C. Lowe
Assistant Manager for Engineering

cc:
P. Psomas, TAD, RFFO

DIST.	LTR	ENC
BACON, R.F.	X	
BENSUSSEN, S.J.		
BORMOLINI, A.M.		
BOYTER, N.C.		
BRAILSFORD, M.D.		
BURDGE, I.		
CARD, R.G.		
COSGROVE, M.M.		
COULTER, W.L.		
CRAWFORD, A.C.		
DERBY, S.		
DIETERLE, S.E.		
FERRERA, D.W.		
FERRERA, K.P.		
GERMAIN, A.L.		
GILPIN, H.E.		
HARDING, W.A.	X	
HARROUN, W.P.		
HEDAHL, T.G.		
HILL, J.A.		
MARTINEZ, L.A.		
NORTH, K.		
PARKER, A.		
PHILLIPS, F.J.		
RHOADES, D.W.		
RODGERS, A.D.		
[illegible]LIN, N.B.		
[illegible] S.M.S.	X	
[illegible] R.E.		
[illegible], N.R.		
VOORHEIS, G.M.		
Arrroso, L.	X	
Haworth, D.	X	
Hughes, F.	X	
Newland, D.J.	X	
Overlid, T.	X	
Petersen, J.	X	
Roberts, E.S.	X	
Wagha, T.	X	

COR CONTROL	X	X
ADMN RECORD		
PATS/T130G		

Reviewed for Addressee
Corres. Control RFP

4/24/98 By
Date

Ref Ltr. #
98RFE00974

ORDER #
5400.5

107

CORRES. CONTROL
OUTGOING LTR. NO.
DOE ORDER 5400.5 NONE

98-RF- 00974

DIST.	LTR	NC
ISSEN, S. J.		
SFORD, M. D.		
GE, L.		
CARD, R. G.		
FERRERA, D. W.		
HARDING, W. A.	X	
HILL, J. A.		
KELL, R. E.		
MARTINEZ, L. A.		
PARKER, A. M.		
SPEARS, M. S.		
TILLER, R. E.		
TUOR, N. R.		
VOORHEIS, G. M.		
BACON, R. F.	X	
BARROSO, J. B.	X	
HARWARD, D. J.	X	
HUGHES, F. P.	X	
NEWLAND, D. J.	X	
OVERLID, T. W.	X	
PATTERSON, J. B.	X	
ROBERTS, R. S.	X	
VAUGHN, T. L.	X	
CORRES.CONTROL	X	
ADMIN RECRD/080		
TRAFFIC		
PATS/T130G		

CLASSIFICATION:

UCNI	
UNCLASSIFIED	X
CONFIDENTIAL	
SECRET	

AUTHORIZED CLASSIFIER SIGNATURE:

Date: 3/10/98

IN REPLY TO RFP CC NO.: N/A

ACTION ITEM STATUS:

PARTIAL/OPEN

CLOSED

LTR APPROVALS:

ORIG. & TYPIST INITIALS: RSR:cjb

RF-46469 (Rev. 2/28/97)

KAISER•HILL COMPANY

March 10, 1998 98-RF-009

David C. Lowe
Assistant Manager for Engineering
DOE, RFFO

APPLICATION OF SURFACE CONTAMINATION GUIDELINES FROM DEPARTMENT OF ENERGY ORDER 5400.5 - WAH-064-98

Kaiser-Hill requests that DOE, RFFO approve Kaiser-Hill's interpretation of Department of Energy (DOE) Order 5400.5, Figure IV-1, "Surface Contamination Guidelines." This interpretation concerns how a surface can be evaluated with respect to the "Allowable Total Residual Surface Contamination" (ATRSC) in Figure IV-1.

Historically , compliance with the ATRSC limits has been met at the Rocky Flats Environment Technology Site (RFETS) by surveying items or areas with direct reading radiation detection equipment. This radiation detection equipment can only detect radioactive material located directly on a surface. Therefore, it currently needs to be assured that all radioactive material present on the surface of the item, or area being surveyed to show compliance with the ATRS limits. In some instances radioactive material may have penetrated into the surface of a material to a limited degree (e.g., a spill of radioactive material in liquid form on a concrete floor), or radioactive material may be present in a material on a surface (e.g., radioactive material present in a coating of paint). In these cases, the current methods for assuring compliance with the ATRSC limits in DOE Order 5400.5 are not sufficient. Alternative methoc need to be developed to assure compliance.

Kaiser-Hill believes that the ATRSC limits may be applied to materials that contain radioactive material if this radioactive material is evaluated with a conservative approach that is appropria to the situation. The following outlines this approach:

1. For a given surface type (i.e., concrete surface, paint sample, etc.), a sample will b taken of the surface to the depth of the radioactive material present (i.e., to a 1 cm depth of the concrete, to the depth of the paint, etc.)
2. The sample will be taken from a defined area of the surface (i.e., from a 10 cm X 10 cm area, from a 10 inch X 10 inch area, etc.)
3. The sample will be analyzed for radioactive material indicative of RFETS (i.e., plutonium, americium, uranium, etc.)

Kaiser-Hill Company, L.L.C.
Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.700
Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

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4. The amount of radioactive material in the sample is then uniformly distributed over the sample area so that the amount of radioactive material present in the sample is in the units of dpm/100cm^2
5. This quantity is then compared with the ATRSC limits.

This approach is conservative and appropriate in that all the radioactive material contained in the surface is concentrated at the top of the surface and then compared with the ATRSC limits. Therefore, the "Total" amount of radioactive material present is being compared with the ATRSC limits. Also, this is conservative and appropriate since it is much harder for the radioactive material contained in a surface to come into contact with an individual than if the radioactive material is present on the surface. This approach is also consistent with the approach in Section 7.5.2.2, "Sample Content," of the Final MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual).

Kaiser-Hill believes that the above approach should be used when evaluating radioactive material that is contained in a surface. Kaiser-Hill requests that DOE, RFFO approve Kaiser-Hill's approach to complying with DOE Order 5400.5, Figure IV-1 by March 30, 1998 to support the Building 123 & 779 Deactivation and Decommissioning projects.

If you have any questions or comments, please contact Rick Roberts at Extension 4869 or Jeff Barroso at Extension 8451.

Wynn A. Harding
Vice-President
Safety Systems & Engineering
Kaiser-Hill Company, L.L.C.

RSR:cjb

Orig. and 1 cc - David C. Lowe

CASE NARRATIVE
RIN 99A8967
Laboratory Report Identification Number: 1643
PSA Module RC01B.3

August 9, 1999

I. Introduction

On April 27, 1999, four waste samples, (RIN 99A8967), were received for analysis at the Sanford Cohen and Associates (SC&A) Southeastern Environmental Laboratory, located in Montgomery, Alabama. The chain-of-custody accompanying the samples requested they be analyzed on a "rush" basis. The samples were analyzed in accordance with Kaiser-Hill specifications stated in the "Statement of Work for Analytical Measurements, Isotopic Determinations by Alpha Spectrometry, Module RCO1-B.3", dated April 24, 1998, and Modification 09, dated July 16, 1998.

II. Analytical Methodology

The radioanalytical results reported for each sample include the site and laboratory sample identification numbers, collection date, method of analysis, and the quality control samples that were analyzed concurrently. All samples were analyzed by an Eichrom Industries, Inc. extraction chromatography method (ACW03) for isotopic uranium, plutonium, and americium.

III. Analytical Results

Deficiencies

See Reanalysis.

Matrix Interferences

There were no indications of matrix interference.

Dilutions

No dilutions were required.

Detection Limits

The required detection limits (RDL) were met for all sample analyses.

PRELIMINARY INFORMATION

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Reanalysis

The Am-243 tracer recovery in samples KH199-1643-03, KH199-1643-04 was less than the 20% specified in the SOW. The samples were reanalyzed beginning with sample preparation and the results were acceptable. The Original and Reanalysis Sample I.D. are listed below.

Original Laboratory Sample I.D.	Reanalysis Laboratory Sample I.D.	Analysis Type
KH199-1643-03	KH199-1643-03B	Am-241
KH199-1643-04	KH199-1643-03B	Am-241

Deviations from Protocols

There were no deviations from the written protocols and analytical methods.

Contacts with the CTR

There were no contacts with the contract technical representative (CTR) regarding these samples.

IV. Quality Control

Site Samples Used for Quality Control Samples:

Site Sample Number	Laboratory Sample Number	Type of Quality Control Analysis Sample
Laboratory Type II Water	SCAQC-1643-LC1	Laboratory Control Sample
99A8967-001.002 T112 A Center	SCAQC-1643-LD1	Laboratory Duplicate Sample
Laboratory Type II Water	SCAQC-1643-PB	Preparation Blank

The analytical results of all quality control samples met the acceptance criteria specified in the SOW.

Sincerely,

Joe Stinson
Laboratory Manager

8/9/99
Date

PRELIMINARY INFORMATION

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Commodore Advanced Sciences, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # 99A8967#002

Page 1 of 1

Collector: C E Hunt [redacted] D. Zimbo [redacted]	Contact/Requester: WOITASCEK	Telephone No.: 3125	MSIN: N/A FAX: N/A
BIN: 99A8967	Sampling Origin: T-112	Purchase Order/Charge Code: 02017100	
Project Title: N/A	Logbook No.: 94 Vans	Ice Chest No.: N/A	Temp.: [illegible]
To (Lab): S. Cohen & Associates	Method of Shipment: Fed. Ex	Bill of Lading/Air Bill No.: 4533 2124 9819	
Protocol: CAS-SOP. 005		Offsite Property No.:	

POSSIBLE SAMPLE HAZARDS/REMARKS: ** ** possible Tar present in Sample

SPECIAL INSTRUCTIONS: Hold Time — Total Activity Exemption: Yes ☐ No ☐

KH199-1643-

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative; Packing
99A8967-001.002	T112 A Center	SOLID	7-21-99	1200	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 01	None; 4 degrees C
99A8967-002.002	T112 A S.W. Corner	SOLID		1230	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 02	None; 4 degrees C
99A8967-003.002	T112 B N.W. Corner	SOLID		1300	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 03	None; 4 degrees C
99A8967-004.002	T112 B N.E. Corner	SOLID		1315	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush] 04	None; 4 degrees C

CBH 7-21-99

Relinquished By: / Date/Time	Received By: / Date/Time	Relinquished By: / Date/Time	Received By: / Date/Time
C E Hunt 7-21-99 1500	Ref #2 T891R 7-21-99 1500	Ref #2 T891R 7/26 [illegible]	J R Christman 7/26/99 1550
J R Christman 7/26/99 1550	Fed EX		L Fisher ISC-9 7/27/99

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

08/10/99 08:21 S. COHEN & ASSOC +++ Salmans/COC/DP 004

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A5967

Project Name: Kaiser-Hill	Chain-of-Custody Number: 99A5967#002	Matrix: Waste
Site Sample ID: 001.002		
Other Sample ID: T112 A CENTER	Collection Date: 7/21/99	Date Received: 7/27/99
	Batch Number: 1643	Laboratory Code: SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1643-01	0.264	0.118	0.129	0.034
ACW03	U-235	KH199-1643-01	0.016	0.031	0.031	0.042
ACW03	U-238	KH199-1643-01	0.270	0.120	0.132	0.050
ACW03	PU-239/240	KH199-1643-01	0.000	0.000	0.000	0.045
ACW03	AM-241	KH199-1643-01	0.000	0.000	0.000	0.086

ENTERED

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Pu	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Am	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB

PRELIMINARY INFORMATION

1000 Montavilla Court * Montgomery, Alabama * 36117 * 334.272.2234 * FAX 334.213.0407

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A8967

Project Name: Kaiser-Hill | Chain-of-Custody Number: 99A8967 002 | Matrix: Waste
Site Sample ID: 002 002
Other Sample ID: T112 A SW CORNER | Collection Date: 7/21/99 | Date Received: 7/27/99
Batch Number: 1643 | Laboratory Code: SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1643-02	0.259	0.121	0.131	0.072
ACW03	U-235	KH199-1643-02	0.000	0.000	0.000	0.043
ACW03	U-238	KH199-1643-02	0.332	0.134	0.149	0.035
ACW03	PU-239/240	KH199-1643-02	0.017	0.034	0.034	0.045
ACW03	AM-241	KH199-1643-02	0.000	0.000	0.000	0.053

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Pu	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Am	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB

PRELIMINARY INFORMATION

Copy

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: 835 · ALPHA ☑ BETA ☐

Calibration Due Date: 10-26-99

Start Date: 8-16-99 · End Date: 8-22-99 · Building: 549 · Location: office

Source: S/N [redacted] · D. P. M.: 24830 · Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7060	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7060	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -13.8	(Print Name / Signature)	% Error:
(Print Name / Signature)		Shift D5	Gross Source cpm:
Shift P1	Gross Source cpm:	Time:	Bkg. cpm:
Time:	Bkg. cpm:	RCT Emp. #	Net Source cpm:
RCT Emp. #	Net Source cpm:	(Print Name / Signature)	% Error:
(Print Name / Signature)	% Error:	Shift P5	Gross Source cpm:
Shift M2	Gross Source cpm:	Time:	Bkg. cpm:
Time:	Bkg. cpm:	RCT Emp. #	Net Source cpm:
RCT Emp. #	Net Source cpm:	(Print Name / Signature)	% Error:
(Print Name / Signature)	% Error:	Shift M6	Gross Source cpm:
ift D2	Gross Source cpm: 7108	Time:	Bkg. cpm:
me: 0600	Bkg. cpm: 0.0	RCT Emp. #	Net Source cpm:
T Emp. # [redacted]	Net Source cpm: 7108	(Print Name / Signature)	% Error:
[redacted]	% Error: -13.3	Shift D6	Gross Source cpm:
(Print Name / Signature)		Time:	Bkg. cpm:
Shift P2	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	% Error:
RCT Emp. #	Net Source cpm:	Shift P6	Gross Source cpm:
(Print Name / Signature)	% Error:	Time:	Bkg. cpm:
Shift M3	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	% Error:
RCT Emp. #	Net Source cpm:	Shift M7	Gross Source cpm:
(Print Name / Signature)	% Error:	Time:	Bkg. cpm:
Shift D3	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	% Error:
RCT Emp. #	Net Source cpm:	Shift D7	Gross Source cpm:
(Print Name / Signature)	% Error:	Time:	Bkg. cpm:
Shift P3	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	% Error:
RCT Emp. #	Net Source cpm:	Shift P7	Gross Source cpm:
(Print Name / Signature)	% Error:	Time:	Bkg. cpm:
Shift M4	Gross Source cpm:	RCT Emp. #	Net Source cpm:
Time:	Bkg. cpm:	(Print Name / Signature)	% Error:
RCT Emp. #	Net Source cpm:		
(Print Name / Signature)	% Error:		
ift D4	Gross Source cpm:		
me:	Bkg. cpm:		
T Emp. #	Net Source cpm:		
(Print Name / Signature)	% Error:		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

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Approved by: LN Cooper, LN Cooper [redacted] 8-17-99

Signature Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) SAC-4 / BC-4 / LUDLUM 2929 — ALPHA [+] BETA [ ]

Counter Serial No.: 824 — Calibration Due Date: 10-13-99

Start Date: 8-2-99 — End Date: 8-8-99 — Building: 549 — Location: office

Source: S/N [redacted] — D. P. M.: 24830 — Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm: N/A	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7604	Shift MS	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.2	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7604	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -7.2	(Print Name / Signature)	% Error:
Shift N1	Gross Source cpm:	Shift DS	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm: N/A	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift PS	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm: N/A
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 7696	Shift M6	Gross Source cpm:
Time: 0 [redacted]	Bkg. cpm: 0.2	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7696	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -6.1	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm: N/A	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 7512	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7512	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -8.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm: N/A	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 7500		
Time: 0600	Bkg. cpm: 0.1		
RCT Emp. # [redacted]	Net Source cpm: 7500		
[redacted]	% Error: -8.5		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

COPY

Approved by: LLooper / LLooper / [redacted] 8-10-99 Date

Signature — Emp. #

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐
SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: RC770 Calibration Due Date: 1-7-00
Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: office
Source: S/N [redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P4 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D1 Time: 0600 RCT Emp. # [redacted] (Print Name / Signature)	Gross Source cpm: 5112 Bkg. cpm: 38 Net Source cpm: 5074 % Error: -10.7	Shift M5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
ift D2 me: 0600 CT Emp. # [redacted] (Print Name / Signature)	Gross Source cpm: 5191 Bkg. cpm: 37 Net Source cpm: 5154 % Error: -9.3	Shift M6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift M7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M4 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
ift D4 me: CT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:		

COPY

% ERROR = $\frac{\text{(Net cpm/E)-Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency=0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: LN Cooper [signature] [redacted] 8-17-99
Signature Emp. # Date

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RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☑

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC700 · Calibration Due Date: 10-22-99

Start Date: 8-11-99 · End Date: 8-22-99 · Building: 549 · Location: active

Source: S[redacted] · D. P. M.: 22723 · Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 5282	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 41	Time:	Bkg. cpm:
RCT Emp. #[redacted]	Net Source cpm: 5241	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -7.9	(Print Name / Signature)	% Error:
(Print Name / Signature)			
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
ift D2	Gross Source cpm: 5262	Shift M6	Gross Source cpm:
ne: 0600	Bkg. cpm: 39	Time:	Bkg. cpm:
T Emp. #[redacted]	Net Source cpm: 5223	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -8.1	(Print Name / Signature)	% Error:
(Print Name / Signature)			
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm:	Shift M7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift [illegible]	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
ift D4	Gross Source cpm:		
ne:	Bkg. cpm:		
Emp. #	Net Source cpm:		
(Print Name / Signature)	% Error:		

COPY

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

118 Approved by: W Cooper / K Cooper / [redacted] 8-17-99

Signature · Emp. # · Date

Electra Performance Test Log

Instrument Serial Number: 1681

Instrument Efficiency Alpha 21.0% Beta 32.4%

Instrument Calibration Due Date 11-11-99

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Accl. (cpm)	Source Acceptable Range (sq)
680141 α	N/A	24830	5214	4171 to 6257
603927 β	N/A	22790 (8-7-99)	7371	5702 to 8853
603927 β	N/A	22723	7362	5890 to 8835

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
7/26/99	7	5000	Pass	457	6811	Pass	[redacted]	M. Munoz	
7/27/99	1	4940	Pass	497	6927	Pass		M. Munoz	
7/28/99	4	4960	Pass	534	6704	Pass		M. Munoz	
7/29/99	5	5020	Pass	474	6865	Pass		M. Munoz	
7/30/99	2	4940	Pass	515	6970	Pass		M. Munoz	
8/2/99	4	5020	Pass	572	6886	Pass		M. Munoz	
8/3/99	3	4870	Pass	501	6972	Pass		M. Munoz	
8/4/99	4	4860	Pass	~~460~~ 480	6966	Pass		M. Munoz	
8/5/99	2	5000	Pass	504	6831	Pass		M. Munoz	
8/9/99	3	4950	Pass	512	6388	Pass		G. Hasenkamp	
8/10/99	2	4940	Pass	573	6520	Pass		G. Hasenkamp	
8/13/99	2	4800	Pass	634	6933	Pass		G. Hasenkamp	
8/16/99	5	5120	Pass	484	6891	Pass		M. Munoz	

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REV... L N Cooper
RO SUPERVISOR PRINT NAME

L N Cooper 8-17-99
RO SUPERVISOR SIGNATURE DATE

NOTE: If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC770 Calibration Due Date: 1-7-00

Start Date: 8-16-99 End Date: 8-22-99 Building: 544 Location: office

Source: S/N [redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 5112	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 38	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5074	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -10.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm: 37	Time: FAX NO. 303 966 2002	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 5191	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 37	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5154	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -9.3	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 5058	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 37	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5021	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -11.6	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 5204		
Time: 0600	Bkg. cpm: 37		
RCT Emp. # [redacted]	Net Source cpm: 5167		
(Print Name / Signature)	% Error: -9.0		

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CN Cooper / LN Cooper [redacted] 8/19/99

Signature Date

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC700 Calibration Due Date: 10-22-99

Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: Office

Source: S[redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 5282	Shift M5	Gross Source cpm:
Time: 0[redacted]	Bkg. cpm: 41	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5241	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -7.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time: FAX NO 303 966 20[illegible]	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 5262	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 39	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5223	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.1	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 5237	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 41	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5196	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 5255		
Time: 0600	Bkg. cpm: 42		
RCT Emp. # [redacted]	Net Source cpm: 5213		
(Print Name / Signature)	% Error: -8.2		

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CN Cooper, J. Cooper [redacted] 8-19-99

Signature Date

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) ALPHA [1] BETA [ ]
SAC-4 / BC-4 / LUDLUM 2929 Counter Serial No.: 824 Calibration Due Date: 10-13-99
Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: office
Source: S/N [redacted] D. P. M.: 24830 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7479	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7479	RCT Emp. #	Net Source cpm:
[signature]	% Error: -8.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time: FAX NO 303 966 206	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 7293	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7293	RCT Emp. #	Net Source cpm:
[signature]	% Error: -11.0	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 7497	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0 → 0.1	Time:	Bkg. cpm:
RCT Emp. [redacted]	Net Source cpm: 7497	RCT Emp. #	Net Source cpm:
[signature]	% Error: -8.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 7576		
Time: 0600	Bkg. cpm: 0.2		
RCT Emp. [redacted]	Net Source cpm: 7576		
[signature]	% Error: -7.5		

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CNCooper / Cooper [redacted] 8-19-99
Signature

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RS FORMS 02-01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) ALPHA [9] BETA [ ]
SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: 835 Calibration Due Date: 10-26-99
Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: office
Source: S[redacted] D. P. M.: 24830 Certification Due Date: N/A

Shift M1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D1 Time: 0600 RCT Emp. [redacted] (Print Name / Signature)	Gross Source cpm: 7060 Bkg. cpm: 0.1 Net Source cpm: 7060 % Error: -13.8	Shift M5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D5 Time: FAX NO 303 966 20 RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D2 Time: 0600 RCT Emp. [redacted] (Print Name / Signature)	Gross Source cpm: 7108 Bkg. cpm: 0.0 Net Source cpm: 7108 % Error: -13.3	Shift M6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D3 Time: 0600 RCT Emp. #[redacted] (Print Name / Signature)	Gross Source cpm: 7254 Bkg. cpm: 0.2 Net Source cpm: 7254 % Error: -11.5	Shift M7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M4 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D4 Time: 0600 RCT Emp. #[redacted] (Print Name / Signature)	Gross Source cpm: 6973 Bkg. cpm: 0.1 Net Source cpm: 6973 % Error: -14.9		

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency - 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper / L Cooper [redacted] 8-19-99
Signature Emp. # Date

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Electra Performance Test Log

Instrument Serial Number: 1665

Instrument Efficiency Alpha 22.5% Beta 30.4%

Instrument Calibration Due Date 9-19-99

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Acct. (cpm)	Source Acceptable Range (sq)
680141 α	N/A	24830	5587	4469 to 6704
603927 β	N/A	22723	6908	5526 to 8289
				to
				to
				to
				to
				to

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
8/18/99	3	4820	Pass	401	6816	Pass	[redacted]	[illegible]	[illegible]
8/19/99	2	4840	Pass	408	6770	Pass		[illegible]	[illegible]
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1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a +20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REVIEWED BY: W Cooper
RO SUPERVISOR PRINT NAME

W Cooper
RO SUPERVISOR SIGNATURE

8-19-99
DATE

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NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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AUG-18-99 WED 13:11 RHO SHEET FAX NO. 303 980 2002 P.02

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: R 770 Calibration Due Date: 1-7-00

Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: office

Source: S/N [redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D1 Time: 0600 RCT Emp. [redacted] (Print Name / Signature)	Gross Source cpm: 5112 Bkg. cpm: 38 Net Source cpm: 5674 % Error: -10.7	Shift M5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D5 Time: FAX NO. 303 966 2008 RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D2 Time: 0600 RCT Emp. [redacted] (Print Name / Signature)	Gross Source cpm: 5191 Bkg. cpm: 37 Net Source cpm: 5154 % Error: -9.3	Shift M6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D3 Time: 0600 RCT Emp. [redacted] (Print Name / Signature)	Gross Source cpm: 5058 Bkg. cpm: 37 Net Source cpm: 5021 % Error: -11.6	Shift M7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M4 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D4 Time: 0600 RCT Emp. [redacted] (Print Name / Signature)	Gross Source cpm: 5204 Bkg. cpm: 37 Net Source cpm: 5167 % Error: -9.0	% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100 Net cpm = gross - background cpm	

E = Efficiency 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper, C N Cooper [redacted] 8/19/99

Signature Date

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RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC700 Calibration Due Date: 10-22-98

Start Date: 8-16-98 End Date: 8-22-98 Building: 549 Location: Office

Source: S[redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D1 Time: 0600 RCT Emp. #[redacted] (Print Name / Signature)	Gross Source cpm: 5782 Bkg. cpm: 41 Net Source cpm: 5741 % Error: -7.7	Shift M5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P1 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: [illegible] Net Source cpm: % Error:	Shift D5 Time: FAX NO 303 966 20[illegible] RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P5 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D2 Time: 0600 RCT Emp. #[redacted] (Print Name / Signature)	Gross Source cpm: 5262 Bkg. cpm: 39 Net Source cpm: 5223 % Error: -8.1	Shift M6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P2 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P6 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D3 Time: 0600 RCT Em[redacted] (Print Name / Signature)	Gross Source cpm: 5237 Bkg. cpm: 41 Net Source cpm: 5196 % Error: -8.5	Shift M7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift P3 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift D7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift M4 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:	Shift P7 Time: RCT Emp. # (Print Name / Signature)	Gross Source cpm: Bkg. cpm: Net Source cpm: % Error:
Shift D4 Time: 0600 RCT Emp. #[redacted] (Print Name / Signature)	Gross Source cpm: 5255 Bkg. cpm: 40 Net Source cpm: 5213 % Error: -8.2		

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper, C N Cooper [redacted] 8-19-98

Signature Emp. # Date

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA [1] BETA [ ]

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: B24 Calibration Due Date: 10-13-99

Start Date: 8-11-99 End Date: 8-22-99 Building: 549 Location: office

Source: S/N [redacted] D. P. M.: 24830 Certification Due Date: N/A

Shift M1	Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7479	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp [redacted]	Net Source cpm: 7479	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time: FAX NO 303 966 2002	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
ift D2	Gross Source cpm: 1293	Shift M6	Gross Source cpm:
me: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp [redacted]	Net Source cpm: 7293	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -11.0	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 1497	Shift M7	Gross Source cpm:
Time: [redacted]	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp [redacted]	Net Source cpm: 7497	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
ift D4	Gross Source cpm: 7576	% ERROR = (Net cpm/E) - Source dpm	x 100
me: 0600	Bkg. cpm: 0.2	Source dpm	
T Emp. # [redacted]	Net Source cpm: 7576	Net cpm = gross - background cpm	
(Print Name / Signature)	% Error: -7.5		

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CNCooper / Signature / [redacted] 8-19-99 Date

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RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No. 835 Calibration Due Date: 10-26-99

Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: office

Source: S/[redacted] D. P. M.: 24830 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7060	Shift M5	Gross Source cpm:
Time: 0[redacted]	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. [redacted]	Net Source cpm: 7060	RCT Emp. #	Net Source cpm:
[signature]	% Error: -13.8	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time: DAY NO 202 988 20	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 1108	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 1108	RCT Emp. #	Net Source cpm:
[signature]	% Error: -13.3	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 7254	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.2	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7254	RCT Emp. #	Net Source cpm:
[signature]	% Error: -11.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 6973		
Time: [redacted]	Bkg. cpm: 0.1		
RCT Emp. [redacted]	Net Source cpm: 6973		
[signature]	% Error: -14.9		
(Print Name / Signature)			

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper / [signature] / [redacted] 8-19-99

Signature Date

COPY

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. Eberline	Mfg. Eberline	Mfg.
Model SAC-4	Model SAC-4	Model
Serial# 835	Serial# 824	Serial#
Cal Due 10/26/99	Cal Due 10/13/99	Cal Due
Bkg. 0.1 cpm	Bkg. 0.0 cpm	Bkg.
Efficiency 33 %	Efficiency 33 %	Efficiency
MDA 6.5 dpm	MDA 6.5 dpm	MDA
Mfg. Eberline	Mfg. Eberline	Mfg.
Model BC-4	Model BC-4	Model
Serial# 700	Serial# 770	Serial#
Cal Due 10/22/99	Cal Due 1/7/00	Cal Due
Bkg. 41 cpm	Bkg. 38 cpm	Bkg. cpm
Efficiency 25 %	Efficiency 25 %	Efficiency %
MDA 200 dpm	MDA 200 dpm	MDA ### ### dpm

Survey Type: QA SWIPE SURVEY
Building: T112 A, B &C
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-16-99 Time: 14:00

RCT: Hersey / [redacted]
Print name Signature

RCT: Espinoza / [redacted]
Print name Signature

PRL #:

Comments:

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A ROOM 4 WALL A6*	1.5	-12		
2	T112A ROOM 6 FLOOR A1*	1.5	-20		
3	T112A ROOM 8 WALL P2*	0.0	4		
4	T112A ROOM 9 FLOOR A3*	0.0	-36		
5	T112A ROOM 11 WALL K1*	0.0	-32		
6	T112A EXTERIOR WEST WALL B1*	0.0	-28		
7	T112A EXTERIOR NORTH WALL A1*	0.0	0		
8	T112A EXTERIOR EAST WALL K3*	1.5	-20		
9	T112A EXTERIOR SOUTH WALL E3*	0.0	-48		
10	T112A EXTERIOR ROOF A2*	0.0	40	N/A	
11	T112B ROOM 1 CEILING B3*	4.5	-24		
12	T112B ROOM 2 FLOOR H1*	0.0	-20		
13	T112B EXTERIOR SOUTH WALL E2*	4.5	24		
14	T112B EXTERIOR NORTH WALL L1*	1.5	-24		
15	T112B EXTERIOR ROOF F1*	0.0	0		
16	T112C ROOM 1 FLOOR C1*	0.0	4		
17	T112C ROOM 3 WALL J2*	0.0	20		
18	T112C ROOM 5 WALL H1*	0.0	-56		
19	T112C ROOM 6 FLOOR C1*	1.5	16		
20	T112C EXTERIOR ROOF M3*	4.5	4		

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
21					
22					
223					
24					
25					
26					
27					
28					
29					
30	N/A				
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

DOCUMENTATION ONLY

Date Reviewed: _____ RS Supervision: _____ / _____ / _____
Print Name Signature Emp. #

Rev. 05/98

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T112 QA swipe survey

	removable counts		total counts	
	alpha	beta	alpha	beta
1	1	38		
2	1	36		
3	0	42		
4	0	32		
5	0	33		
6	0	34		
7	0	41		
8	1	36		
9	0	29		
10	0	51		
11	3	35		
12	0	36		
13	3	47		
14	1	35		
15	0	41		
16	0	42		
17	0	46		
18	0	27		
19	1	45		
20	3	42		
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40				

INFORMATION ONLY

Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A8967

Project Name: Kaiser-Hill Chain-of-Custody Number: 99A8967#002 Matrix: Waste
Site Sample ID: 003.002
Other Sample ID: T112 B NW CORNER Collection Date: 7/21/99 Date Received: 7/27/99
Batch Number: 1643 Laboratory Code: SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1643-03	0.030	0.049	0.050	0.076
ACW03	U-235	KH199-1643-03	0.000	0.000	0.000	0.045
ACW03	U-238	KH199-1643-03	0.035	0.048	0.048	0.064
ACW03	PU-238/240	KH199-1643-03	0.022	0.044	0.044	0.059
ACW03	AM-241	KH199-1643-03B	2.37	0.740	0.879	0.119

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Pu	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Am	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB

PRELIMINARY INFORMATION

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Report Identification Number: 99A8967

Project Name: Kaiser-Hill Chain-of-Custody Number: 99A8967#002 Matrix: Waste
Site Sample ID: 004.002
Other Sample ID: T112 B NE CORNER Collection Date: 7/21/99 Date Received: 7/27/99
Batch Number: 1643 Laboratory Code: SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (pCi/g)	2 σ Counting Error (pCi/g)	Total Error (pCi/g)	MDA (pCi/g)
ACW03	U-233/234	KH199-1643-04	0.068	0.061	0.062	0.037
ACW03	U-235	KH199-1643-04	0.017	0.033	0.034	0.045
ACW03	U-238	KH199-1643-04	0.013	0.027	0.027	0.037
ACW03	PU-239/240	KH199-1643-04	-0.010	0.020	0.020	0.117
ACW03	AM-241	KH199-1643-04B	0.000	0.000	0.000	0.088

Quality Control Samples

Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Pu	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Am	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB

PRELIMINARY INFORMATION

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Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample
Preparation Blank (PB)

Report Identification Number: 99A8967

Project Name: Kaiser-Hill	Chain-of-Custody Number: None	Matrix: Water
Site Sample ID: N/A		
Other Sample ID: PB	Collection Date: 7/27/99	Date Received: 7/27/99
		Laboratory Code: SCA

Method Number	Radionuclide	Laboratory Sample ID	Activity (dpm)	2 σ Counting Error (dpm)	Total Error (dpm)	MDA (dpm)
ACW03	U-233/234	SCAQC-1643-PB	0.043	0.049	0.050	0.039
ACW03	U-235	SCAQC-1643-PB	0.000	0.000	0.000	0.048
ACW03	U-238	SCAQC-1643-PB	0.079	0.071	0.072	0.068
ACW03	PU-239/240	SCAQC-1643-PB	0.000	0.000	0.000	0.056
ACW03	AM-241	SCAQC-1643-PB	0.000	0.000	0.000	0.053

Quality Control Samples			
Radionuclide	Laboratory Control Sample (LC)	Laboratory Duplicate Analysis (LD)	Preparation Blank (PB)
U	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Pu	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB
Am	SCAQC-1643-LC1	SCAQC-1643-LD1	SCAQC-1643-PB

PRELIMINARY INFORMATION

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Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Sample Evaluation

Report Identification Number: 99A8967

Project Name: Kaiser-Hill — Laboratory Code: SCA

Laboratory Contol Sample (LC1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	(CV) Decay Corrected Activity of Spike Added (dpm)	(OV) Laboratory Control Sample Activity (dpm)	Laboratory Control Sample % Recovery (Accuracy)	Number of σ Between CV and OV
ACW03	AM-241	SCAQC-1643-LC1	4.24 ∓ 0.117	4.38 ∓ 1.17	103	0.191
ACW03	PU-239/240	SCAQC-1643-LC1	4.55 ∓ 0.100	5.13 ∓ 1.37	113	0.573
ACW03	U-233/234	SCAQC-1643-LC1	8.02 ∓ 0.321	7.26 ∓ 1.75	90.5	0.660
ACW03	U-238	SCAQC-1643-LC1	8.02 ∓ 0.321	7.74 ∓ 1.86	96.4	0.231

Laboratory Duplicate Sample (LD1) Evaluation

Method Number	Radionuclide	Laboratory Sample ID	Original Sample Activity (pCi/g)	Duplicate Sample Activity (pCi/g)	Difference Between Original Activity and Duplicate Sample Activity (E)	Ratio of the Difference Between the Sample Activities and the Propagated Measurement Original Activity and Uncertainty of the Difference at 2 σ (E/R)
ACW03	U-233/234	SCAQC-1643-LD1	0.264 ∓ 0.129	0.244 ∓ 0.133	0.020	0.108
ACW03	U-235	SCAQC-1643-LD1	0.016 ∓ 0.031	0.018 ∓ 0.037	0.003	0.055
ACW03	U-238	SCAQC-1643-LD1	0.270 ∓ 0.132	0.170 ∓ 0.109	0.100	0.587
ACW03	PU-239/240	SCAQC-1643-LD1	0.000 ∓ 0.000	0.041 ∓ 0.059	0.041	0.696
ACW03	AM-241	SCAQC-1643-LD1	0.000 ∓ 0.000	0.054 ∓ 0.078	0.054	0.695

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PRELIMINARY INFORMATION

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CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8967
EVENT: 001
DUPLICATE ID: N/A
ISSUE DATE: 7/19/99

WASTE STREAM ID: N/A
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK:

Comments/Problems encountered during sampling: Temp in upper 80's. Slight breeze. Tar roof excells temp. Sample taken in 4 inch squares.
001.001 Rad Screen Final measurment 12" x 16" area taken for Sample at 126 grams - Isotopk 001.002 wt 144 grams 12'x16' area

Location Description: T 112 A Center

Other ID: Center Sample location

Sample Appearance: Black solid chunks with silver material present. Sample could contain tar.

Sampling Device: Stainless Scraper

Sample Date: 7-21-99 Sample Time: 1200 Rad Screen Date: 7-21-99 1200 CDS

Was generator notified to receive excess sample? (YES) X (NO)

Samplers Signature: [signature] [signature]
Employee Number: [redacted] [redacted]

Date: 7-21-99 7-21-99

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CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8467
EVENT: 002
DUPLICATE ID: N/A
ISSUE DATE: 7/19/99

WASTE STREAM ID: N/A
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK:

Comments/Problems encountered during sampling: Temp in upper 80°s, Slight breeze
- Rad screen 002.001 wt. 125 grams taken in 12 x 16 inch area
- Isotopic 002.002 wt 129 grams taken in 12 x 16 inch area

Tar Roof excells temperature.

Location Description: T 112 A

Other ID: South West Corner

Sample Appearance: Black solid chunk Some Silver material present, Sample Could Contain tar

Sampling Device: Stainless Scraper

Sample Date: 7-21-99 Sample Time: 1230 Rad Screen Date: 7-21-99

Was generator notified to receive excess sample? (YES) ✓ (NO) _____

Samplers Signature: [signature] [signature]
Employee Number: [redacted] [redacted]

Date: 7-21-99 7-21-99

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CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8967
EVENT: 003
DUPLICATE ID: N/A
ISSUE DATE: 7-19-99

WASTE STREAM ID: N/A
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK: Y

Comments/Problems encountered during sampling: On ladder while taking Sample. Temp upper 80's problems cutting out Sample. RadScreen 003.001 130 grams, 4x16 inch sample used. Isotopic 003.002 125 grams, 4x16 inch sample used.

Location Description: T 112 B

Other ID: North west Corner

Sample Appearance: Grey metal, light gauge

Sampling Device: Tin Snips

Sample Date: 7-21-99 Sample Time: 1300 Rad Screen Date: 7-21-99

Was generator notified to receive excess sample? (YES) ✓ (NO) _____

Samplers Signature: [redacted] [redacted]
Employee Numb[redacted]

Date: 7-21-99 7-21-99

CAS SAMPLE REQUEST WORKSHEET

RIN: 99A8967
EVENT: 004
DUPLICATE ID: N/A
ISSUE DATE: 7-19-99

WASTE STREAM ID: N/A
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK: ↓

Comments/Problems encountered during sampling: Temp lower 90's Sampled on a ladder. problems collecting sample
Radscreen 004.001 - 127 grams 6x16 inch sample used.
Isotopic 004.002 - 138 grams 10x8 inch Sample Used

Location Description: T112B

Other ID: North East Corner

Sample Appearance: Grey metal, light gauge, Tar and a Silicone type glue on metal.

Sampling Device: Tin Snips

Sample Date: 7-21-99 Sample Time: 1315 Rad Screen Date: 7-21-99

Was generator notified to receive excess sample? (YES) ✓ (NO) _____

Samplers Signature: [redacted] [redacted]
Employee Number:

Date: 7-21-99 7-21-99

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SAMPLE SUMMARY FOR RIN: 99A8967

RIN Title: N/A
Project Name: D&D PROJECTS
Task Name: T-112
Aggregate Area: N/A

Sampling Team: CAS
Sampling Mgr/Coordinator: Paul Wojtasek
Samplers:
Field Logbook ID: 94 Van
Media: SOLID

This sample summary is supplied to waste generators as notification of sample collection. Inquires into the status of this sampling effort may be directed to the Analytical Services Division (ASD).

Bottle Number	Customer Bottle Number	Location	LIC (See Attached)	Laboratory	Date Collected	Date Shipped	Date Returned	Comments
99A8967-001.001		T-112	1	Thermo NuTech				
99A8967-001.002		T-112	2	S. Cohen & Associates				
99A8967-002.001		T-112	1	Thermo NuTech				
99A8967-002.002		T-112	2	S. Cohen & Associates				
99A8967-003.001		T-112	1	Thermo NuTech				
99A8967-003.002		T-112	2	S. Cohen & Associates				
99A8967-004.001		T-112	1	Thermo NuTech				
99A8967-004.002		T-112	2	S. Cohen & Associates				

Returning Excess Sample Material:

Unmodified sample material remaining after analysis is generally returned to the generator. The generator must be prepared to receive and dispose of excess sample material for applicable state and federal regulations. Regulatory exclusions for returning excess sample material are specified in the Code of Colorado Regulation (CCR) 1007-3, Part 261.4(d) 'Samples'. If problems with the disposal of excess sample material are encountered, the Environmental Coordinator for the generation area should be contacted for resolution of the issues. Only sample material which has not been modified during analysis will be returned. Material which has been acidified for preservation purposes will not be returned.

Customer Acknowledgement: Paul Wojtasek Pam [redacted]
(Sign and Print Name)

Comments:

Line Item Codes:

1) OS01A003 (Rad-Screen - Solid)
2) RC01B003 (Isotopic (Soil))

SAMPLE SUMMARY FOR RIN: 99A8967

RIN Title: N/A
Project Name: D&D PROJECTS
Task Name: T-112
Aggregate Area: N/A

Sampling Team: CAD
Sampling Mgr/Coordinator: ~~[illegible]~~ Paul Wojtacek
Samplers: CA, DL
Field Logbook ID: 94 Van
Media: SOLID

This sample summary is supplied to waste generators as notification of sample collection. Inquires into the status of this sampling effort may be directed to the Analytical Services Division (ASD).

Bottle Number	Customer Bottle Number	Location	LIC (See Attached)	Laboratory	Date Collected	Date Shipped	Date Returned	Comments
99A8967-001.001	T112B center	T-112	1	Thermo NuTech	7-21-99	7-21-99		
99A8967-001.002	↓	T-112	2	S. Cohen & Associates	↓	↓		
99A8967-002.001	T112B SW Corner	T-112	1	Thermo NuTech				
99A8967-002.002	↓	T-112	2	S. Cohen & Associates				
99A8967-003.001	T112B NW Corner	T-112	1	Thermo NuTech				
99A8967-003.002	↓	T-112	2	S. Cohen & Associates				
99A8967-004.001	T112B NE Corner	T-112	1	Thermo NuTech				
99A8967-004.002	↓	T-112	2	S. Cohen & Associates	↓	↓		

Returning Excess Sample Material:

Unmodified sample material remaining after analysis is generally returned to the generator. The generator must be prepared to receive and dispose of excess sample material for applicable state and federal regulations. Regulatory exclusions for returning excess sample material are specified in the Code of Colorado Regulation (CCR) 1007-3, Part 261.4(d) 'Samples'. If problems with the disposal of excess sample material are encountered, the Environmental Coordinator for the generation area should be contacted for resolution of the issues. Only sample material which has not been modified during analysis will be returned. Material which has been acidified for preservation purposes will not be returned.

Customer Acknowledgement: _____
(Sign and Print Name)

Comments:

Line Item Codes:

1) OS01A003 (Rad-Screen - Solid)
2) RC01B003 (Isotopic (Soil))

Thermo NUtech - Rocky Flats
Radscreen Results

ENTERED

RIN: 99A8967
Analysis: Radscreen
Report Date: 07/26/99

Distribution/Fax: ASDI 4558

Laboratory Sample ID	APO Sample ID			Matrix	Gross Alpha		Gross Beta		Total Activity pCi/g	DOT Class
	RIN	Event	Bottle		pCi/g	2σ	pCi/g	2σ		
99070249-01	99A8967	001	001	Waste	5.6	3.2	9.3	3.1	21.20	NONRAD
99070249-02	99A8967	002	001	Waste	3.6	2.2	4.0	2.1	11.90	NONRAD
99070249-03	99A8967	003	001	Waste	3.8	6.3	11.0	7.0	28.10	NONRAD
99070249-04	99A8967	004	001	Waste	5.3	5.0	-0.8	4.2	14.50	NONRAD

DOT Classification <2000 pCi/g total activity is NONRAD
>= 2000 pCi/g total activity is RAD

Total Activity Calculated as the sum of the gross alpha and beta activities AND the measurement uncertainties for these two measurements. If the measured activity is negative, 0 pCi/g (instead of the negative value) is used to calculate the total activity.

Analysis Methods Sample Preparation Procedures: ATP-005, "Preparation of Oils, Solvents and Combustibles for Analysis of Gross Alpha and Beta Activity" (1 g aliquot) and L-5278-A, "Sample Preparation for Radiological Screening by Gas Proportional Counting".
Counting Procedure: ATP-008, "Operation of Tennelec LB4100 Gas Proportional Counters".

Kathy Haywood /Date 7/26/99
Technical Review

Ronald R. Taylor /Date 7/26/99
Quality Assurance Review

Thermo NUtech - Rocky Flats
RFETS - Building 788D
Golden, Colorado 80402
(303) 966-6260

07/27/1999 08:11 3039664303

KAISER•HILL
COMPANY
ANALYTICAL SERVICES DIVISION

FAX COVER SHEET FOR PRELIMINARY DATA REPORTS

RIN NUMBER: 99A8967

FROM: TOM SZYDLOWSKI

PHONE: (303) 966-8165

FAX: (303) 966-4555

TO: Wojtaszek

FAX: 4096

PHONE: _____

NUMBER OF PAGES, INCLUDING COVER SHEET: _____

Please contact _____ **if the fax is not received in its entirety.**
(phone number)

NOTE:
If the accompanying data is stamped preliminary it is because the final data package has not been received and validated or verified. Until the data is validated or verified it must be considered preliminary. Final data is usually not received until 30 days after the laboratory has received the sample. Verification or validation is completed a short time following receipt of the final data package. You will be sent a copy of the verification or validation report, which you should review. If qualifiers have been attached to individual results they may affect the way that you use the data. If you have any question please contact your Analytical Services Project Lead, do not contact the laboratory directly.

203.002

2.37 pCi/gm ^{241}Am

$$\frac{2.37\ pCi}{gm} \times \frac{125\ gms}{64\ in^2} \times \frac{(1\ inch)^2}{(2.54\ cm)^2} \times \frac{2.2 \times 10^{12}\ dpm}{pCi}$$

$$\frac{(2.37)(125)(1)(2.2)}{(64)(2.54)(2.54)} = \frac{dpm}{cm^2} = \frac{651.75}{412.9024}$$

$$= 1.578\ dpm/cm^2$$

$$= \frac{157.8\ dpm}{100\ cm^2}.$$

12 dpm/G
9 inch
6 pCi
3 pCi
0 pCi

ANALYTICAL SERVICES DIVISION
SAMPLING AND ANALYSIS REQUEST FORM

ASD USE ONLY

RIN: 99A8967 Priority: Rush

ASD Project Lead: Szydlowski Phone: 8165 Pager:

CUSTOMER INFORMATION

Date: 07/19/99

Project Charge No.: 150104-20

Requestor:	PAUL A. WOJTASZEK	Phone:	x 3125	Pager:	
		Bldg:	T893B	Fax	x 4046
Secondary Contact:	DAVE BARNES	Phone:	x 5352	Pager:	212-6541
		Bldg:	T130B	Fax	
Fax Data Results To:	PAUL A. WOJTASZEK	Phone:	x 3125	Fax	x 4046

SAMPLE INFORMATION

Sample Location: T112A, T112B

Sample Description and Sample Identifiers:

Sample Matrix: ☐ Aqueous ☐ Org. Liqui ☒ Solid ☐ Sludge ☐ Multi Phase

When will sample be available for sampling? 6:00 AM, TUES, 07/20/99

When is data required by requestor? 08/06/99 - ASAP

Estimated quantity Available for Sampling:

Waste Stream ID No. (if known): Waste Stream Name (if known):

EPA CODES: MSDS: ○ Yes ◉ No ATTACHED: ○ Yes ○ No

COMPATIBILITY CODE: WFO/IDC:

90 Day Area? ○ Yes ◉ No Start Date: End Date:

ANALYSES REQUESTED

☑ Alpha/Beta Screen	☐ Total VOA	☐ TCLP VOA	☐ pH	Other: 4 samples
☐ Gross Alpha/Beta	☐ Total SVOAS	☐ TCLP SVOAS	☐ Fingerprint	
☑ Isotopics	☐ Total Metals (ICP	☐ TCLP Metals	☐ IR	
☐ gil Isotopics	☐ Total PCBs	☐ TCLP PCBs	Analyses Criticality Sensitive? ○ Yes ◉ No	
☐ Gamma Spec	☐ Total Herbicides	☐ TCLP Herbicides	If Yes ○ Single ○ Double Analyses:	

RADIOLOGICAL ENTRY REQUIREMENTS

IS THIS A RADIOACTIVE WASTE STREAM? Suspected to be radioactive? ○ Yes ◉ No

☐ Pu ☐ Am ☐ U Other:

Located In: ☐ RBA ☐ RMA ☐ PMMA ☐ CA ☐ HCA ☐ RA ☐ HRA Other Area:

RCT Support: ◉ Yes ○ No Comments:

RWP Required: ○ Yes ◉ No

PWSE Required: ◉ Yes ○ No

GENERAL ENTRY REQUIREMENTS/SAFETY CONCERNS

☑ Plan of the Day	☑ Industrial Hygiene Assistance	☐ Electrical
☐ Maintenance Assistance	☐ Carcinogen Control Area	☐ HWCP
☐ Operator's Assistance	☐ Lock-out/Tag-out	☐ Confined Space
☐ Mechanical	☐ Waste Contains Fluorides	Other:

Special Instructions: Samplers require ladder safety training. There needs be two (2) samplers with this training.

Requestor Signature: Paul A. Wojtaszek Date: 07/19/99

Note: Excess sample will be returned to generator.

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ANALYTICAL SERVICES DIVISION
SAMPLING AND ANALYSIS REQUEST FORM

ASD USE ONLY

RIN: 99A8967 Priority:

ASD Project Lead: SZYDLOWSKI, TOM Phone: 8165 Pager:

CUSTOMER INFORMATION

Date: 07/19/1999

Project Charge No.: 02017100

Requestor: WOJTASCEK Phone: 3125 Pager:
Bldg: Fax:

Secondary Contact: BARNES, DAVE Phone: 5352 Pager:
Bldg: Fax:

Fax Data Results To: WOJTASZEK Phone: 4046 Fax:

SAMPLE INFORMATION

Sample Location: T-112

Sample Description and Sample Identifiers: Roffing material

Sample Matrix: ☐ Aqueous ☐ Org. Liquid ☑ Solid ☐ Sludge ☐ Multi Phase

When will sample be available for sampling? 07/20/1999

When is data required by requestor? 08/05/1999

Estimated quantity Available for Sampling:

Waste Stream ID No. (if known): Waste Stream Name (if known):

EPA CODES: MSDS: ○ Yes ◉ No ATTACHED: ○ Yes ◉ No

COMPATIBILITY CODE WFC/ IDC:

90 Day Area? ○ Yes ◉ No Start Date: End Date:

ANALYSES REQUESTED

☑ Alpha/Beta Screen	☐ Total VOA	☐ TCLP VOA	☐ pH	Other:
☐ Gross Alpha/Beta	☐ Total SVOAS	☐ TCLP SVOAS	☐ Fingerprint	
☑ Isotopics	☐ Total Metals (ICP)	☐ TCLP Metals	☐ IR	
☐ g/l Isotopics	☐ Total PCBs	☐ TCLP PCBs	Analyses Criticality Sensitive? ○ Yes ◉ No	
☐ Gamma Spec	☐ Total Herbicides	☐ TCLP Herbicides	If Yes: ○ Single ○ Double Analyses:	

RADIOLOGICAL ENTRY REQUIREMENTS

IS THIS A RADIOACTIVE WASTE STREAM? Suspected to be radioactive? ○ Yes ◉ No

☐ Pu ☐ Am ☐ U Other:

Located In: ☐ RBA ☐ RMA ☐ RMMA ☐ CA ☐ HCA ☐ RA ☐ HRA Other Area:

RCT Support: ◉ Yes ○ No Comments:

RWP Required: ○ Yes ◉ No

PWRE Required: ◉ Yes ○ No

GENERAL ENTRY REQUIREMENTS/SAFETY CONCERNS

☑ Plan of the Day	☑ Industrial Hygiene Assistance	☐ Electrical
☐ Maintenance Assistance	☐ Carcinogen Control Area	☐ IWCP
☐ Operator's Assistance	☐ Lock-out/Tag-out	☐ Confined Space
☐ Mechanical	☐ Waste Contains Fluorides	Other:

Special Instructions: Both persons sent to sample this job must have current ladder safety training.

Requestor Signature: [signature] Date: 07/21/99

Note: Excess sample will be returned to generator.

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Commodore Advanced Sciences, Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # 99A8967#002
		Page 1 of 1

Collector C E Hewett [redacted] / D. Zigmund [redacted]	Contact/Requester WOJTASCEK	Telephone No. 3125 MSIN N/A FAX
RIN 99A8967	Sampling Origin T-112	Purchase Order/Charge Code 02017100
Project Title N/A	Logbook No. 94 Van	Ice Chest No. N/A Temp. [redacted]
To (Lab) S. Cohen & Associates	Method of Shipment Fed. Ex	Bill of Lading/Air Bill No.
Protocol CAS-SOP. 003		Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS ** ** Possible Tar present in Sample

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative : Packing
99A8967-001.002	T112 A Center	SOLID	7-21-99	1200	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush]	None 4 degrees C
99A8967-002.002	T112 A S.W Corner	SOLID		1230	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush]	None 4 degrees C
99A8967-003.002	N.W T112B Corner	SOLID		1300	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush]	None 4 degrees C
99A8967-004.002	N.E T112B Corner	SOLID		1315	T-112	125-G P/G	RC01B003 (Isotopic (Soil)) [Rush]	None 4 degrees C

EGH 7-21-99

Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
C E Hewett	7-21-99 1500	Ref #2 [redacted]	7-21-99 1500				

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

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Commodore Advanced Sciences, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # 99A8967#001

Page 1 of 1

Collector C E Haught [redacted] D. Tyson [redacted]	Contact/Requester WOJTASCEK	Telephone No. 3125 MSIN N/A FAX
RIN 99A8967	Sampling Origin T-112	Purchase Order/Charge Code 02017100
Project Title N/A	Logbook No. 94 Van	Ice Chest No. N/A Temp. N/A
To (Lab) Thermo NuTech	Method of Shipment Vehicle	Bill of Lading/Air Bill No. N/A
Protocol CAS-SOP. 003		Offsite Property No. N/A

POSSIBLE SAMPLE HAZARDS/REMARKS Possible Tar present in ** sample

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☐ No ☐

COPY

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative / Packing
99A8967-001.001	T112A Center	SOLID	7-21-99	1200	T-112	125-G P/G	OS01A003 (Rad-Screen - Solid) [Routine-r.screen]	None None
99A8967-002.001	T112A S.W. Corner	SOLID		1230	T-112	125-G P/G	OS01A003 (Rad-Screen - Solid) [Routine-r.screen]	None None
99A8967-003.001	T112B N.W Corner	SOLID		1300	T-112	125-G P/G	OS01A003 (Rad-Screen - Solid) [Routine-r.screen]	None None
99A8967-004.001	N.C T112B Corner	SOLID		1315	T-112	125-G P/G	OS01A003 (Rad-Screen - Solid) [Routine-r.screen]	None None

CEH 7-21-99

Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
CE Haught	7-21-99 1508	[signature]	7/21/99 1508				
Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Relinquished By:	Date/Time	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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Sanford Cohen & Associates
Southeastern Environmental Laboratory

Radioanalytical Results

Quality Control Tracer Yield

Report Identification Number: 99A8967

Project Name: Kaiser-Hill Laboratory Code: SCA

Laboratory Sample ID	Am-243	Pu-242	U-232
KH199-1643-01	43.21	80.72	91.06
KH199-1643-02	69.25	75.36	96.53
KH199-1643-03		62.71	89.6
KH199-1643-03B	63.56		
KH199-1643-04		55.87	88.32
KH199-1643-04B	84.4		
SCAQC-1643-LC1	91.26	85.99	91.91
SCAQC-1643-LD1	47.42	65.78	82.86
SCAQC-1643-PB	77.91	66.52	93.83

1000 Mardisville Court * Montgomery, Alabama * 36117 * 334.272.2234 * FAX 334.270.0801

PRELIMINARY INFORMATION

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KAISER•HILL
COMPANY
ANALYTICAL SERVICES DIVISION

FAXED 8/10/99

FAX COVER SHEET FOR PRELIMINARY DATA REPORTS

RIN NUMBER: 99A8967

FROM: TOM SZYDLOWSKI

PHONE: (303) 966-8165

FAX: (303) 966-4555

TO: Wojtaszek

FAX: 4046

PHONE: _____

NUMBER OF PAGES, INCLUDING COVER SHEET: _____

Please contact _____ **if the fax is not received in its entirety.**
(phone number)

NOTE:
If the accompanying data is stamped preliminary it is because the final data package has not been received and validated or verified. Until the data is validated or verified it must be considered preliminary. Final data is usually not received until 30 days after the laboratory has received the sample. Verification or validation is completed a short time following receipt of the final data package. You will be sent a copy of the verification or validation report, which you should review. If qualifiers have been attached to individual results they may affect the way that you use the data. If you have any question please contact your Analytical Services Project Lead, do not contact the laboratory directly.

Appendix 4

Radiological Survey Data for Interior and Exterior of Trailer T112C (Survey Unit C)

APPENDIX 4 - Survey Unit C (T112C)

- Survey Unit C Data Summary
- MARSSIM Calibration/Verification Worksheet
- Total and Removable Radiological Survey Results
- Performance Test Logs
- Survey Package Cover Sheet
- Sampling and Survey Instructions
- Grid Survey Map

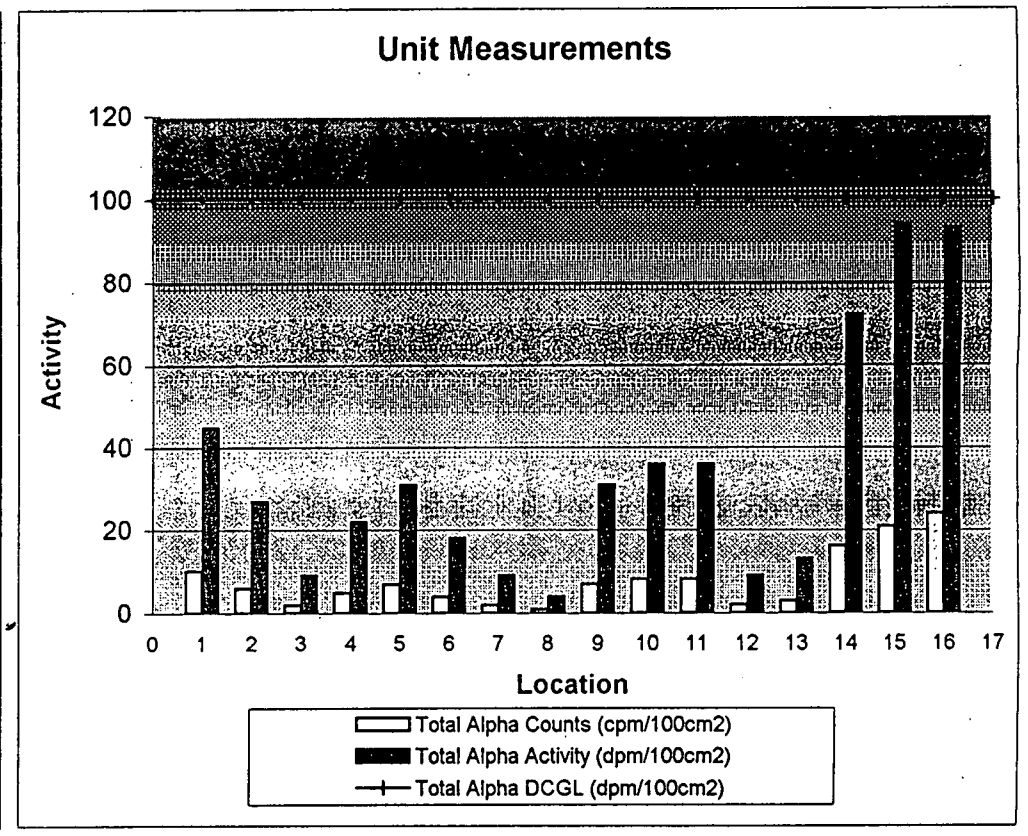
Total Alpha

Survey Unit C Data Summary - T112C

August 19, 1999

					8/5/1999	8/19/99
standard deviation:	28.67686	max:	94.0	Instrument background:	0 cpm	3 cpm
mean:	34.3125	min:	4.0	Instrument efficiency:	22.3 %	22.5 %
median:	29			Instrument MDA:	33 dpm	48 dpm

	Surface Location			Grid Location	Total Alpha Counts (cpm/100cm²)	Total Alpha Activity (dpm/100cm²)	Total Alpha DCGL (dpm/100cm²)
1	Room	1	Floor	B4	10	45	100
2	Room	1	Floor	C2	6	27	100
3	Room	1	Wall	D1	2	9	100
4	Room	1	Wall	E2	5	22	100
5	Room	2	Wall	K2	7	31	100
6	Room	3	Wall	E1	4	18	100
7	Room	3	Wall	J2	2	9	100
8	Room	3	Wall	L1	1	4	100
9	Room	4	Wall	E2	7	31	100
10	Room	5	Wall	B2	8	36	100
11	Room	5	Wall	H1	8	36	100
12	Room	5	Wall	I1	2	9	100
13	Room	7	Wall	C1	3	13	100
14	Exterior	N	Wall	J3	16	72	100
15	Exterior	S	Wall	G1	21	94	100
16	Exterior		Roof	M3	24	93	100



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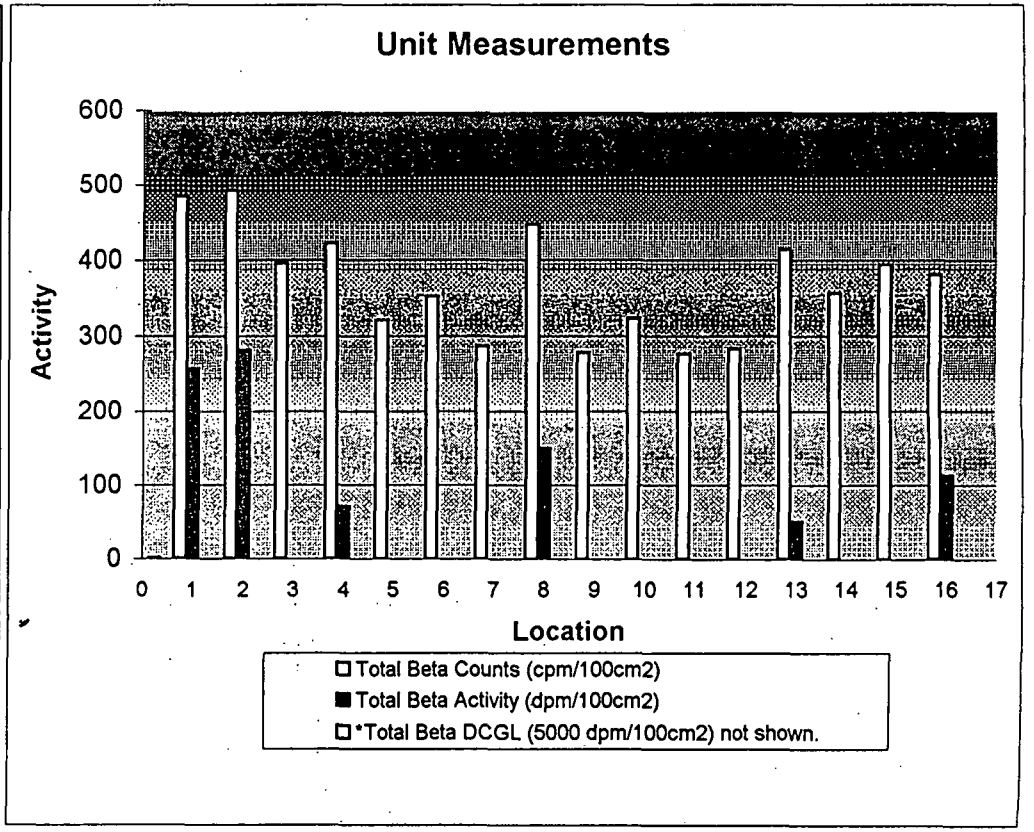
Total Beta

Survey Unit C Data Summary - T112C

August 19, 1999

					8/5/1999	8/19/99
standard deviation:	220.1215	max:	281.0	Instrument background:	398 cpm	346 cpm
mean:	-75.8125	min:	-364.0	Instrument efficiency:	33.5 %	30.4 %
median:	-67			Instrument MDA:	285 dpm	294 dpm

	Surface Location			Grid Location	Total Beta Counts (cpm/100cm^2)	Total Beta Activity (dpm/100cm^2)	Total Beta DCGL (dpm/100cm^2)
1	Room	1	Floor	B4	484	257	5000
2	Room	1	Floor	C2	492	281	5000
3	Room	1	Wall	D1	396	-6	5000
4	Room	1	Wall	E2	422	72	5000
5	Room	2	Wall	K2	321	-230	5000
6	Room	3	Wall	E1	352	-137	5000
7	Room	3	Wall	J2	286	-334	5000
8	Room	3	Wall	L1	448	149	5000
9	Room	4	Wall	E2	277	-361	5000
10	Room	5	Wall	B2	323	-224	5000
11	Room	5	Wall	H1	276	-364	5000
12	Room	5	Wall	I1	282	-346	5000
13	Room	7	Wall	C1	415	51	5000
14	Exterior	N	Wall	J3	357	-122	5000
15	Exterior	S	Wall	G1	394	-12	5000
16	Exterior		Roof	M3	380	113	5000



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Removable Alpha

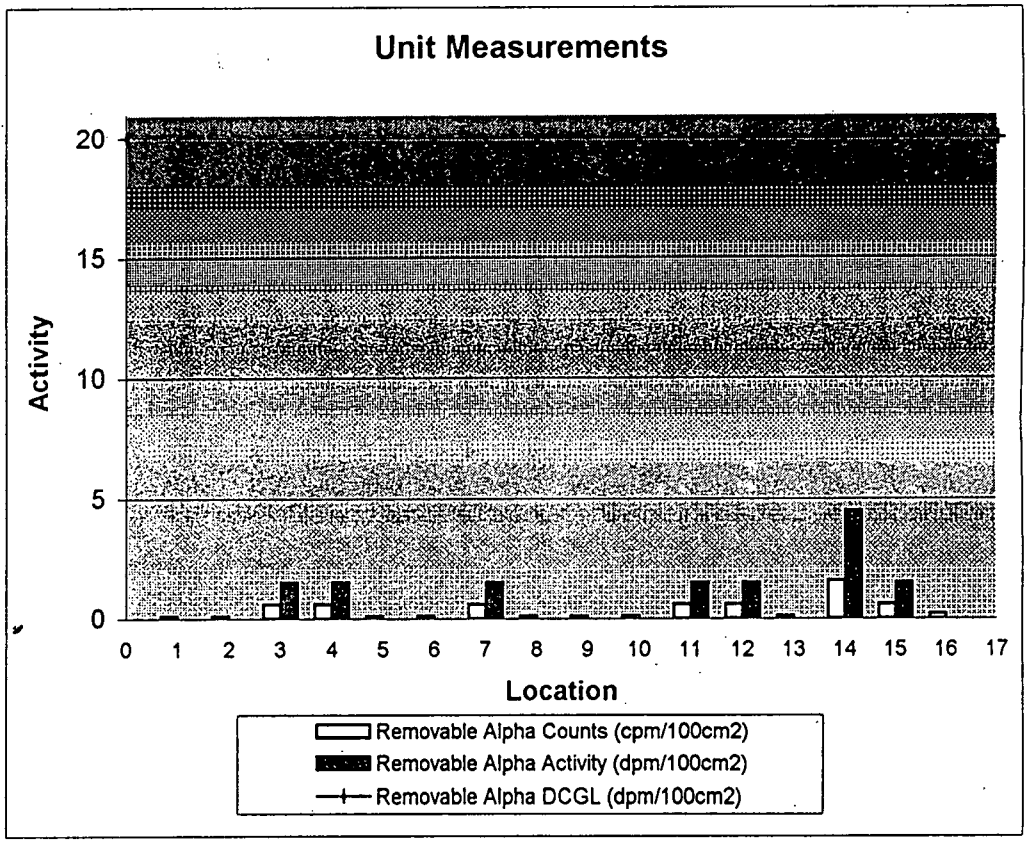
Survey Unit C Data Summary - T112C

August 19, 1999

standard deviation:	1.220912	max:	4.5
mean:	0.84375	min:	0.0
median:	0		

	8/5/1999	8/19/99
Instrument background:	0.1 cpm	0.2 cpm
Instrument efficiency:	33 %	33 %
Instrument MDA:	6.5 dpm	7.5 dpm

	Surface Location			Grid Location	Removable Alpha Counts (cpm/100cm^2)	Removable Alpha Activity (dpm/100cm^2)	Removable Alpha DCGL (dpm/100cm^2)
1	Room	1	Floor	B4	0	0	20
2	Room	1	Floor	C2	0	0	20
3	Room	1	Wall	D1	1	1.5	20
4	Room	1	Wall	E2	1	1.5	20
5	Room	2	Wall	K2	0	0	20
6	Room	3	Wall	E1	0	0	20
7	Room	3	Wall	J2	1	1.5	20
8	Room	3	Wall	L1	0	0	20
9	Room	4	Wall	E2	0	0	20
10	Room	5	Wall	B2	0	0	20
11	Room	5	Wall	H1	1	1.5	20
12	Room	5	Wall	I1	1	1.5	20
13	Room	7	Wall	C1	0	0	20
14	Exterior	N	Wall	J3	2	4.5	20
15	Exterior	S	Wall	G1	1	1.5	20
16	Exterior		Roof	M3	0	0	20



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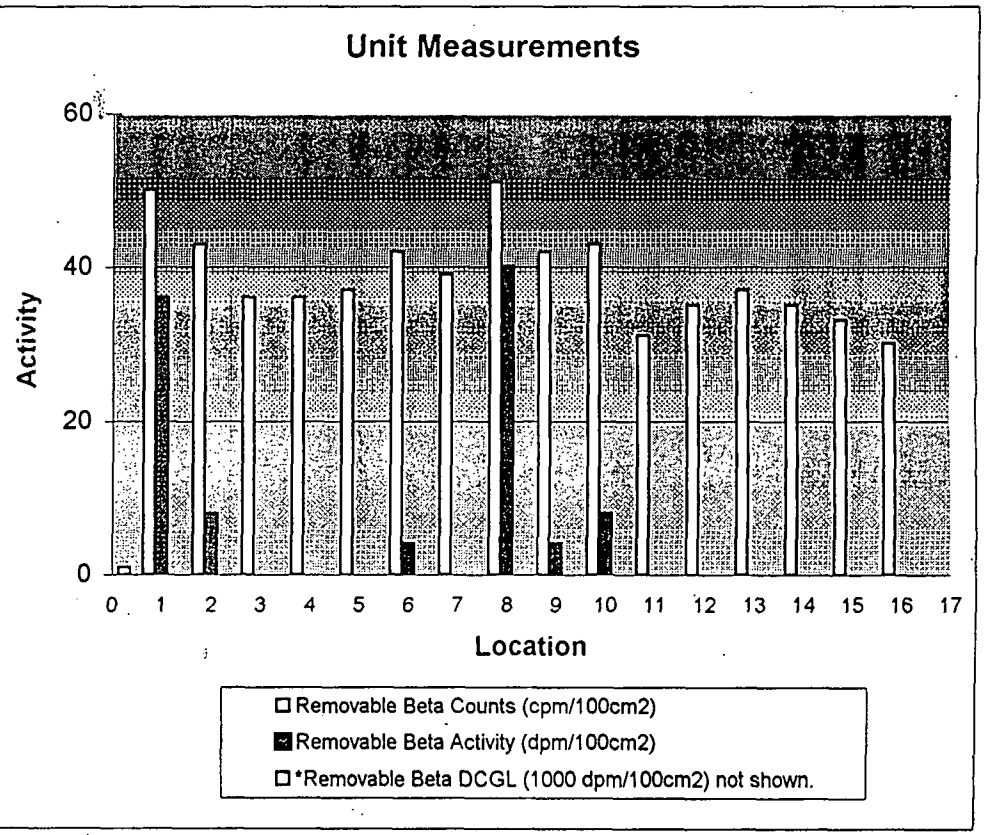
Removable Beta

Survey Unit C Data Summary - T112C

August 19, 1999

					8/5/1999	8/19/99
standard deviation:	23.9207	max:	40.0	Instrument background:	41 cpm	40 cpm
mean:	-8.75	min:	-40.0	Instrument efficiency:	25 %	25 %
median:	-16			Instrument MDA:	200 dpm	200 dpm

	Surface Location			Grid Location	Removable Beta Counts (cpm/100cm^2)	Removable Beta Activity (dpm/100cm^2)	Removable Beta DCGL (dpm/100cm^2)
1	Room	1	Floor	B4	50	36	1000
2	Room	1	Floor	C2	43	8	1000
3	Room	1	Wall	D1	36	-20	1000
4	Room	1	Wall	E2	36	-20	1000
5	Room	2	Wall	K2	37	-16	1000
6	Room	3	Wall	E1	42	4	1000
7	Room	3	Wall	J2	39	-8	1000
8	Room	3	Wall	L1	51	40	1000
9	Room	4	Wall	E2	42	4	1000
10	Room	5	Wall	B2	43	8	1000
11	Room	5	Wall	H1	31	-40	1000
12	Room	5	Wall	I1	35	-24	1000
13	Room	7	Wall	C1	37	-16	1000
14	Exterior	N	Wall	J3	35	-24	1000
15	Exterior	S	Wall	G1	33	-32	1000
16	Exterior		Roof	M3	30	-40	1000



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Survey Area: T112	**Building:** T112C
Survey Unit: C (T112C Exterior)	

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit C removable surface contamination data are calculated on the "Survey Unit C Data" sheet. Because all removable survey measurement results are less than $DCGL_W$ (alpha less than 20 dpm/100 cm^2, beta less than 1000 dpm/100 cm^2), the survey unit clearly meets the removable contamination release criterion.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated was based on the use of this test.

The performance of the sign test was not necessary due to the fact that each individual net result was less than the $DCGL_W$. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the $DCGL_W$.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of smears with the ACTUAL survey unit standard deviation.

The actual removable survey standard deviations for Unit C are: α 2.38 β 23.9

Thus, the ACTUAL required number of measurements is as follows:

α:

$\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/ SD_{REMOVABLE}$

$\Delta/\delta_{transuranics} = (20\ dpm/100cm^2 - 10\ dpm/100cm^2)/ 2.38\ dpm/100cm^2 = 4.2$

β:

$\Delta/\delta = (DCGL_{REMOVABLE} - LBGR_{REMOVABLE})/ SD_{REMOVABLE}$

$\Delta/\delta_{transuranics} = (1000\ dpm/100cm^2 - 500\ dpm/100cm^2)/ 23.9\ dpm/100cm^2 = 20.9$

Where:

Δ/δ	is the relative shift or the resolution of measurements in units of measurement uncertainty
$DCGL_{REMOVABLE}$	is the removable surface contamination derived concentration guideline value (DOE Order 5400.5 removable surface contamination limit equals 20 dpm/100cm^2 for transuranics per the T112A-C Pre Demolition Survey Plan)
$LBGR_{REMOVABLE}$	is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to value utilized in original sample size calculation).
$SD_{REMOVABLE}$	is the ACTUAL standard deviation of the removable surface contamination measurements

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (The highest published value is utilized for conservatism).

Survey Area: T112	Building: T112C
Survey Unit: C (T112C Exterior)	

Post Survey Removable Contamination Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of removable surface contamination measurements for the applicable survey unit using the following MARSSIM, Section 5.5.2.3 formula that is based on radioactive contaminants of concern not being present in the background:

α

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

β

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

Where:

1.645 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$N = \underline{10.9} * 1.2 = \underline{13}$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 α and β Removable Surface Contamination measurements were required in Unit C.

Step 4:

Draw conclusions from the data: All measurements are less than $DCGL_W$. The minimum number of required removable survey measurements were collected. Thus, survey Unit C complies with the removable contamination release criteria.

D. A. BARNES	[redacted]		8-19-99
Prepared By: Printed Name		Radiological Engineer Signature	Date
E STARBROOKS			8/19/99
Reviewed By: Printed Name		Radiological Engineer Signature	Date

Survey Area: T112	**Building:** T112C
Survey Unit: C (T112C Exterior)	

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 1:

Conduct a preliminary data review: (the mean, standard deviation, and median of the Unit C data are calculated on the "Survey Unit C Data" sheet. Because all total surface activity (TSA or TSC) measurement results are less than $DCGL_W$ (less than 100 dpm/100 cm^2) , the survey unit clearly meets the TSA release criterion.

A graphical data review was also performed on the attached form. The posting plot indicated that spatial trends of elevated areas are not present. The histogram indicated that no isolated areas of elevated activity are present.

Step 2:

Select the statistical tests: The one-sample sign test was selected to assess the data, with $\alpha = 0.05$ and $\beta = 0.05$. The number of sample points calculated (see "Total Surface Activity Measurement Calculation Worksheet") was based on the use of this test. A local area background (LAB) value was subtracted from each gross measurement to calculate a net result, thus the sign test applies (sign test is typically applied only when the contaminant is not present in background).

The performance of the sign test was not necessary due to the fact that each individual net result was less than the $DCGL_W$. Thus, the sign test would result in the rejection of the null hypothesis, and conclude that the median concentration of residual radioactivity in the survey unit is less than the $DCGL_W$.

Step 3:

Verify the assumptions of the test: The assumed data variance, as indicated by the assumed standard deviation was verified by re-calculating the required number of samples with the ACTUAL survey unit standard deviation.

The actual total surface contamination standard deviations for Unit C are: α 28.7 β 215

Thus, the ACTUAL required number of samples is as follows:

$$\Delta/\delta = (DCGL_{TSA} - LBGR_{TSA})/ SD_{TSA}$$

α

$$\Delta/\delta_{transuranics} = (100 \text{ dpm}/100\text{cm}^2 - 50 \text{ dpm}/100\text{cm}^2)/ 28.7 \text{ dpm}/100\text{cm}^2 = 1.74$$

β

$$\Delta/\delta_{transuranics} = (5000 \text{ dpm}/100\text{cm}^2 - 2500 \text{ dpm}/100\text{cm}^2)/ 215 \text{ dpm}/100\text{cm}^2 = 11.6$$

Where:

Δ/δ	is the relative shift or the resolution of measurements in units of measurement uncertainty
$DCGL_{TSA}$	is the total surface Activity derived concentration guideline value (DOE Order 5400.5 total surface Activity limit equals 100 dpm/100cm^2 for transuranics and 5000 dpm/100cm^2 for uranium, per the T112A-C Pre Demolition Survey Plan)
$LBGR_{TSA}$	is the lower bound of the gray region – the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor (set equal to the value utilized in the original sample size calculation).
SD_{TSA}	is the ACTUAL standard deviation of the total surface Activity

Determine the Sign P value by looking up the relative shift (Δ/δ) in Table 5.4 of MARSSIM (the Sign P value is the estimated probability that a random measurement from the survey unit will be less than the DCGL when the survey unit median is actually at the LBGR). The Sign P value from Table 5.4, equals 0.998650 for a relative shift of 3.0 (Actual value approaches one. The highest published value is utilized for conservatism).

Survey Area: T112	Building: T112C
Survey Unit: C (T112C Exterior)	

Post Survey Total Surface Activity Summary Statistics Calculation Verification Worksheet

Step 3: Continued

Determine the number of TSA surface Activity measurements for the applicable survey unit using the following

MARSSIM, Section 5.5.2.3 formula that is based on Plutonium contaminants not being present in the background:

α and β

$N = (1.645 + 1.645)^2 / 4(\text{Sign P} - 0.5)^2$

$N = (1.645 + 1.645)^2 / 4(0.998650-0.5)^2 = \underline{10.9}$

Where:

1.646 is the alpha and beta decision error value (95% confidence) per the T112A-C Pre Demolition Survey Plan

Sign P equals 0.998650

Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.

$N = \underline{10.9} * 1.2 = \underline{13}$

Conclusion: Utilizing a conservative relative shift value of 3.0, a minimum of 13 Total Surface Activity measurements were required in Unit C.

Step 4:

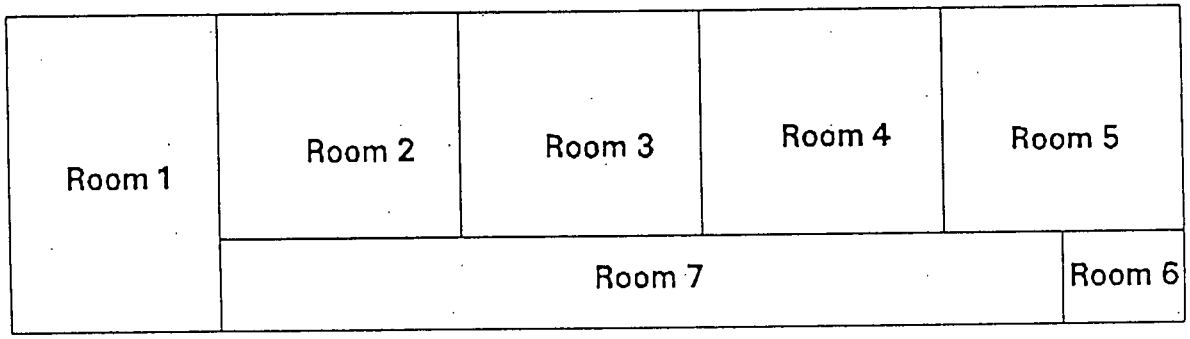
Draw conclusions from the data: All measurements are less than $DCGL_W$. The minimum number of required TSA measurements were collected. Thus, survey Unit C complies with the TSA release criteria.

D. A. BARNES	[redacted]		8-19-99
Prepared By: Printed Name		Radiological Engineer Signature	Date
E S HASBROUCK			8/19/99
Reviewed By: Printed Name		Radiological Engineer Signature	Date

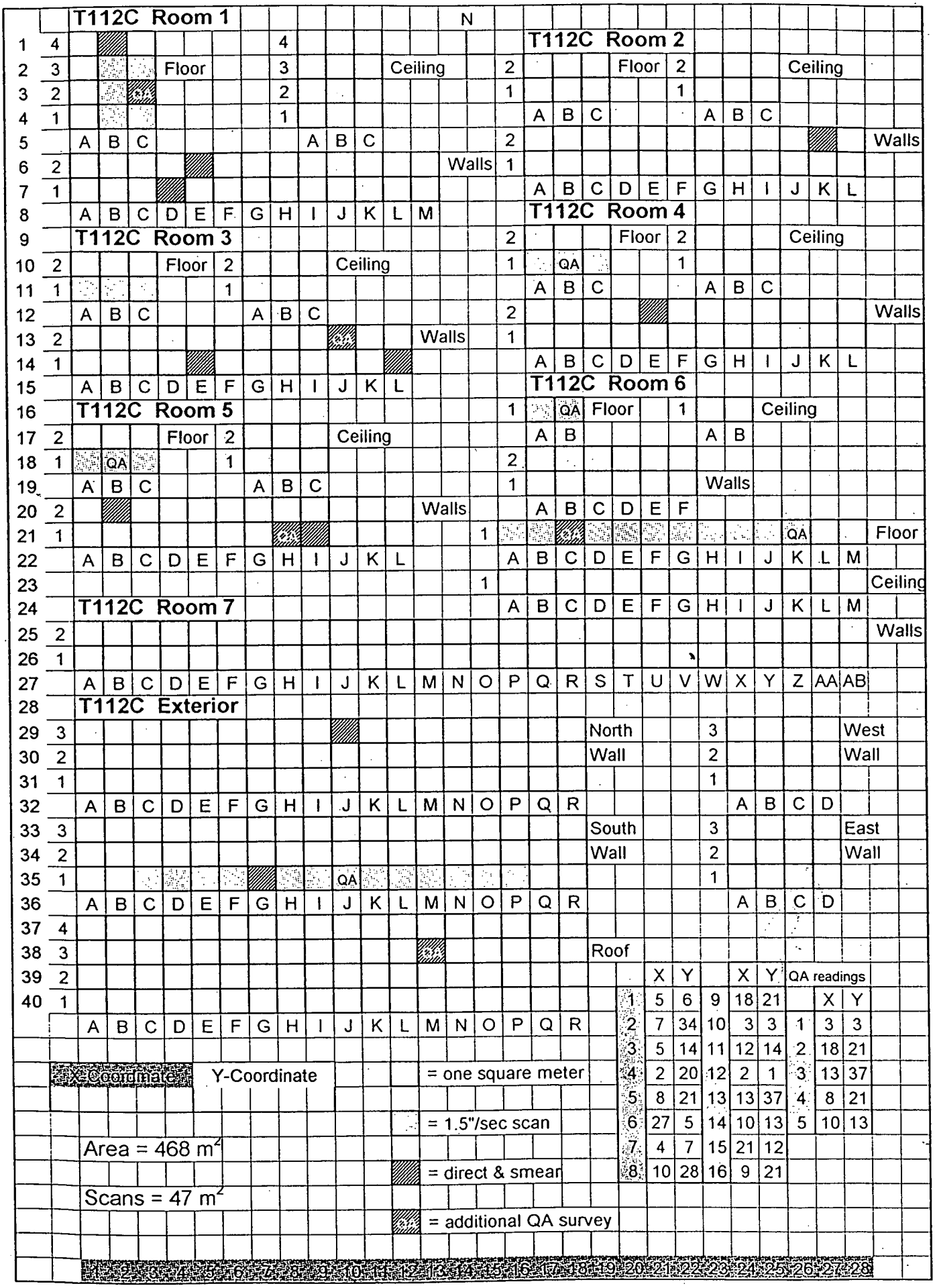
15/23

cfloorplan.xls

Building T112C Floorplan



160


T112C Room 1
T112C Room 2
T112C Room 3
T112C Room 4
T112C Room 5
T112C Room 6
T112C Room 7
T112C Exterior
Floor
Ceiling
Walls
QA
N
North Wall
West Wall
South Wall
East Wall
Roof
X-Coordinate
Y-Coordinate
= one square meter
= 1.5"/sec scan
= direct & smear
= additional QA survey
Area = 468 m²
Scans = 47 m²
QA readings
1 5 6 9 18 21
2 7 34 10 3 3 1 3 3
3 5 14 11 12 14 2 18 21
4 2 20 12 2 1 3 13 37
5 8 21 13 13 37 4 8 21
6 27 5 14 10 13 5 10 13
7 4 7 15 21 12
8 10 28 16 9 21

Electra Performance Test Log

Instrument Serial Number	Instrument Efficiency Alpha	Beta
1827	22.3% (22 8-19-99)	33.5%
	Instrument Calibration Due Date 10-28-99	

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Accl. (cpm)	Source Acceptable Range (sq)
~~603680141~~ α	N/A	24830	5537	4430 to 6645
603927 β	N/A	22723	7612	6090 to 9135
				to
				to
				to
				to
				to

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
8/3/99	5	5710	Pass	511	7066	Pass	[redacted]	M Munoz	
8/4/99	5	5640	Pass	539	7137	Pass		M Munoz	
8/5/99	4	5000	Pass	478	7040	Pass		M Munoz	
8/6/99	3	4860	P	580	7149	P		Jas Herrick	
8/9/99	3	5146	Pass	539	7353	Pass		L Hasenkamp	
8/10/99	1	5091	Pass	606	6723	Pass		L. Hasenkamp	
8/11/99	4	5040	Pass	597	6782	Pass		L Hasenkamp	
8/12/99	3	5010	Pass	556	7047	Pass		L Hasenkamp	
8/13/99	1	5070	Pass	658	7120	Pass		L Hasenkamp	
/ /									
/ /									
/ /									
/ /									

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REVIEWED BY: L N Cooper
RO SUPERVISOR PRINT NAME

L N Cooper 8-17-99
RO SUPERVISOR SIGNATURE DATE

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

162

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) SAC-4 / BC-4 / LUDLUM 2929 — ALPHA ☐ BETA ☑

Counter Serial No.: BC702 — Calibration Due Date: 11-20-99

Start Date: 8/2/99 — End Date: 8/8/99 — Building: 549 — Location: office

Source: S/N [redacted] — D. P. M.: 22723 — Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D1	Gross Source cpm: 5405	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 37	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5368	RCT Emp. #	Net Source cpm:
M J Hoz M	%Error: -5.5	(Print Name / Signature)	%Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm: 5553
Time:	Bkg. cpm:	Time: 0800	Bkg. cpm: 43
RCT Emp. #	Net Source cpm:	RCT Emp. # [redacted]	Net Source cpm: 5512
(Print Name / Signature)	%Error:	Jay Krowski	%Error: -3.0
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D2	Gross Source cpm: 5241	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 40	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5201	RCT Emp. #	Net Source cpm:
M J Hoz M	%Error: -8.4	(Print Name / Signature)	%Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D3	Gross Source cpm: 5298	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 38	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5260	RCT Emp. #	Net Source cpm:
M J Hoz M	%Error: -7.4	(Print Name / Signature)	%Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D4	Gross Source cpm: 5324		
Time: 0600	Bkg. cpm: 41		
RCT Emp. # [redacted]	Net Source cpm: 5283		
[signature]	%Error: -7.0		
(Print Name / Signature)			

% ERROR= (Net cpm/E)-Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency=0.33 for the SAC-4 and 0.25 for the BC-4

163 Approved by: LN Cooper — Signature — [redacted] Emp. # — 8-10-99 Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC905 · ALPHA ☐ BETA ☑ · Calibration Due Date: 9-30-99

Start Date: 8-3-99 · End Date: 8-8-99 · Building: 549 · Location: office

Source: S/N [redacted] · D. P. M.: 22723 · Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 5097	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 41	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5056	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -11.0	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm: 5028
Time:	Bkg. cpm:	Time: 0800	Bkg. cpm: 41
RCT Emp. #	Net Source cpm:	RCT Emp. # [redacted]	Net Source cpm: 4987
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error: -12.2
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 5015	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 39	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 4976	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -12.4	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 5119	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 38	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5081	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -10.6	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 5092		
Time: 0600	Bkg. cpm: 41		
RCT Emp. # [redacted]	Net Source cpm: 5051		
(Print Name / Signature)	% Error: -11.1		

% ERROR = $\frac{(\text{Net cpm}/E) - \text{Source dpm}}{\text{Source dpm}} \times 100$

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

164 Approved by: I N Cooper / L Looper [redacted] 8-10-99 Date

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: 835 · ALPHA ☐ BETA ☐

Start Date: 8-2-99 · End Date: 8-8-99 · Building: 549 · Location: office

Source: SN [redacted] · D. P. M.: 24830 · Calibration Due Date: 10-26-99 · Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D1	Gross Source cpm: 7372	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.2	Time:	Bkg. cpm:
RCT Emp. [redacted]	Net Source cpm: 7372	RCT Emp. #	Net Source cpm:
[redacted]	%Error: -10.0	(Print Name / Signature)	%Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D2	Gross Source cpm: 7193	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7193	RCT Emp. #	Net Source cpm:
[redacted]	%Error: -12.2	(Print Name / Signature)	%Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D3	Gross Source cpm: 7224	Shift M7	Gross Source cpm:
Time: [redacted]	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. [redacted]	Net Source cpm: 7224	RCT Emp. #	Net Source cpm:
[redacted]	%Error: -11.8	(Print Name / Signature)	%Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D4	Gross Source cpm: 7290		
Time: 0600	Bkg. cpm: 0.1		
RCT Emp. [redacted]	Net Source cpm: 7290		
[redacted]	%Error: -11.0		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

165 Approved by: CN Cooper / [redacted] 10-99

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

ALPHA [x] BETA [ ]

INSTURMENT MODEL: (Circle One)
SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: 824 Calibration Due Date: 10-13-99
Start Da[redacted] End Date: 6-15-99 Building: 549 Location: OFFICE
Source: [redacted] D. P. M.: 24830 Certification Due Date: _____

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D1	Gross Source cpm: 7590	Shift M5	Gross Source cpm:
Time: 0630	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7590	RCT Emp. #	Net Source cpm:
[redacted] / [redacted]	%Error: -8.9	(Print Name / Signature)	%Error:
(Print Name / Signature)			
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm: 7681
Time:	Bkg. cpm:	Time: [redacted]	Bkg. cpm: 0.1
RCT Emp. #	Net Source cpm:	RCT Emp. # [redacted]	Net Source cpm: 7681
(Print Name / Signature)	%Error:	[redacted] / [redacted]	%Error: -6.3
		(Print Name / Signature)	
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D2	Gross Source cpm: 7803	Shift M6	Gross Source cpm:
Time: 0630	Bkg. cpm: 0.3	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7803	RCT Emp. #	Net Source cpm:
[redacted] / [redacted]	%Error: -11.6	(Print Name / Signature)	%Error:
(Print Name / Signature)			
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D3	Gross Source cpm: 7437	Shift M7	Gross Source cpm:
Time: 0630	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7437	RCT Emp. #	Net Source cpm:
[redacted] / [redacted]	%Error: -9.2	(Print Name / Signature)	%Error:
(Print Name / Signature)			
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D4	Gross Source cpm: 7708		
Time: 0630	Bkg. cpm: 0.3		
RCT Emp. # [redacted]	Net Source cpm: 7708		
[redacted] / [redacted]	%Error: -5.9		
(Print Name / Signature)			

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CN Cooper / [redacted] 6-17-99
Signature Date

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.1 cpm	Bkg.	0.2 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	6.5 dpm	MDA	7.5 dpm	MDA	

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NEtech		
Model	BC-4	Model	BC-4	Model	Electra		
Serial#	700	Serial#	770	Serial#	1665		
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	9/19/99		
Bkg.	40 cpm	Bkg.	37 cpm	Bkg.	3	346 cpm	
Efficiency	25 %	Efficiency	25 %	Efficiency	22.5	30.4	%
MDA	200 dpm	MDA	200 dpm	MDA	48	294 dpm	

Survey Type: CONTAMINATION SURVEY
Building: T112 A,B & C
Location: 280 Yard
Purpose: Resurvey per R.E. (MARSSIM Survey)

RWP #: N/A

Date: 08-19-99 Time: 11:00

RCT: Hersey / / [redacted]
Print name Signature Emp. #

RCT: N/A / / /
Print name Signature Emp. #

PRL #:

Comments:

Alpha removable was a two minute count.

INFORMATION ONLY

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112C ROOF M3	9.1	-24	93	0
2	T112B ROOF J3	3.0	-44	151	141
3	T112A ROOF G3	0.0	-28	58	26
4	T112A ROOF R5	10.6	16	27	0
5	T112A ROOF A2	4.5	-44	53	-43
6	T112A ROOF A6	0.0	20	76	-69

N/A

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#1			71	20
QA	#2			129	118
QA	#3	N/A		44	-13
QA	#6			62	95

N/A

Date Reviewed: RS Supervision: / /
Print Name Signature Emp. #

COVER SHEET

	removable counts		total counts	
	alpha	beta	alpha	beta
1	6	34	24	346
2	2	29	37	389
3	0	33	16	354
4	7	44	9	346
5	3	29	15	333
6	0	45	20	325
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21			19	352
22			32	382
23			13	342
24			17	375
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INFORMATION ONLY

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. Eberline	Mfg. Eberline	Mfg.
Model SAC-4	Model SAC-4	Model
Serial# 835	Serial# 824	Serial#
Cal Due 10/26/99	Cal Due 10/13/99	Cal Due N/A
Bkg. 0.1 cpm	Bkg. 0.2 cpm	Bkg.
Efficiency 33 %	Efficiency 33 %	Efficiency
MDA 6.5 dpm	MDA 7.5 dpm	MDA
Mfg. Eberline	Mfg. Eberline	Mfg. NEtech
Model BC-4	Model BC-4	Model Electra
Serial# 700	Serial# 770	Serial# 1665
Cal Due 10/22/99	Cal Due 1/7/00	Cal Due 9/19/99
Bkg. 40 cpm	Bkg. 37 cpm	Bkg. 3 / 346 cpm
Efficiency 25 %	Efficiency 25 %	Efficiency 22.5 / 30.4 %
MDA 200 dpm	MDA 200 dpm	MDA 48 / 294 dpm

Survey Type: CONTAMINATION SURVEY
Building: T112 A,B & C
Location: 280 Yard
Purpose: Resurvey per R.E. (MARSSIM Survey)

RWP #: N/A

Date: 08-19-99 Time: 11:00

RCT: Hersey / [signature] (Print name / Signature)

RCT: N/A / / (Print name / Signature / Emp. #)

PRL #:

Comments:

Alpha removable was a two minute count.

COPY

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112C ROOF M3	9.1	<200	93	<294
2	T112B ROOF J3	<7.5	<200	151	<294
3	T112A ROOF G3	<7.5	<200	58	<294
4	T112A ROOF R5	10.6	<200	<48	<294
5	T112A ROOF A2	<7.5	<200	53	<294
6	T112A ROOF A6	<7.5	<200	76	<294
	N/A				

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
QA	#1			71	<294
QA	#2			129	<294
QA	#3	N/A		<48	<294
QA	#6			62	<294
	N/A				

ate Reviewed: 8/18/99 RS Supervision: S Engelhardt / [signature] (Print Name / Signature)

Electra Performance Test Log

Instrument Serial Number: 1665

Instrument Efficiency Alpha 22.5% Beta 30.4%

Instrument Calibration Due Date 9-19-99

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Acct. (cpm)	Source Acceptable Range (sq)
680141 α	N/A	24830	5587	4469 to 6704
603927 β	N/A	22723	6908	to 5526 to 8289
				to
				to
				to
				to
				to

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
8/18/99	3	4820	Pass	401	6816	Pass	[redacted]	[illegible]	[signature]
8/19/99	2	4840	Pass	408	6770	Pass		[illegible]	[signature]
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a +20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REVIEWED BY: W Cooper
RO SUPERVISOR PRINT NAME

W Cooper
RO SUPERVISOR SIGNATURE

8-19-99
DATE

COPY

NOTE If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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AUG-19-99 THU 13:11 KAW SAFETY FAX NO. 303 966-2062 P. 02

RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC770 Calibration Due Date: 1-7-00

Start Date: 8-11-99 End Date: 8-22-99 Building: 549 Location: office

Source: S/N [redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D1	Gross Source cpm: 5112	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 38	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5074	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error: -10.7	(Print Name / Signature)	%Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm: 37	Time: FAX NO. 303 966 2002	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D2	Gross Source cpm: 5191	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 37	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5154	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error: -9.4	(Print Name / Signature)	%Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D3	Gross Source cpm: 5058	Shift M7	Gross Source cpm:
Time: 0 [redacted]	Bkg. cpm: 37	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5021	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error: -11.6	(Print Name / Signature)	%Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	%Error:	(Print Name / Signature)	%Error:
Shift D4	Gross Source cpm: 5204		
Time: 0600	Bkg. cpm: 37		
RCT Emp. # [redacted]	Net Source cpm: 5167		
(Print Name / Signature)	%Error: -9.0		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper, [redacted] 8/19-99

Signature Emp. # Date

OK

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RS FORMS.02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐

SAC-4 / BC-4 / LUDLUM 2929 · Counter Serial No.: BC700 Calibration Due Date: 10-22-99

Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: Office

Source: S[redacted] D. P. M.: 22723 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 5782	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 41	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5241	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -7.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm: FTV	Time: FAX NO 303 966 2062	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 5262	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 39	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5223	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.1	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 5237	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 41	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 5196	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error: -8.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 5255		
Time: 0600	Bkg. cpm: 42		
RCT Emp. # [redacted]	Net Source cpm: 5213		
(Print Name / Signature)	% Error: -8.2		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper, C N Cooper, [redacted] 8-19-99

Signature Date

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[redacted]

RS FORMS 02-01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTRUMENT MODEL: (Circle One) ALPHA [1] BETA [ ]
SAC-4 / BC-4 / LUDLUM 2929 Counter Serial No.: B24 Calibration Due Date: 10-13-99
Start Date: 8-16-99 End Date: 8-22-99 Building: 549 Location: office
Source: S[redacted] D. P. M.: 24830 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P1	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7479	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7479	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -8.7	(Print Name / Signature)	% Error:
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm: TV	Time: FAX NO 303 966 2062	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 7293	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7293	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -11.0	(Print Name / Signature)	% Error:
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 7497	Shift M7	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. [redacted]	Net Source cpm: 7497	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -8.5	(Print Name / Signature)	% Error:
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 7576		
Time: 0600	Bkg. cpm: 0.2		
RCT Emp. # [redacted]	Net Source cpm: 7576		
[redacted]	% Error: -7.5		

% ERROR = (Net cpm/E) - Source dpm / Source dpm x 100

Net cpm = gross - background cpm

E = Efficiency 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: CNCooper / Sloopee [redacted] 8-19-99
Signature Emp. # Date

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RS FORMS 02.01-03

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

SWIPE COUNTER PERFORMANCE LOG

INSTURMENT MODEL: (Circle One) ALPHA ☐ BETA ☐
SAC-4 / BC-4 / LUDLUM 2929 Counter Serial No.: 835 Calibration Due Date: 10-26-99
Start Date: [redacted] End Date: 8-22-99 Building: 549 Location: office
Source: S/N [redacted] D. P. M.: 24830 Certification Due Date: N/A

Shift M1	Gross Source cpm:	Shift P4	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D1	Gross Source cpm: 7060	Shift M5	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.1	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7060	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -13.8	(Print Name / Signature)	% Error:
(Print Name / Signature)			
Shift P1	Gross Source cpm:	Shift D5	Gross Source cpm:
Time:	Bkg. cpm:	Time: FAX NO 303 966 20	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M2	Gross Source cpm:	Shift P5	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D2	Gross Source cpm: 1108	Shift M6	Gross Source cpm:
Time: 0600	Bkg. cpm: 0.0	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 1108	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -13.3	(Print Name / Signature)	% Error:
(Print Name / Signature)			
Shift P2	Gross Source cpm:	Shift D6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M3	Gross Source cpm:	Shift P6	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D3	Gross Source cpm: 7254	Shift M7	Gross Source cpm:
Time: 0 [redacted]	Bkg. cpm: 0.2	Time:	Bkg. cpm:
RCT Emp. # [redacted]	Net Source cpm: 7254	RCT Emp. #	Net Source cpm:
[redacted]	% Error: -11.5	(Print Name / Signature)	% Error:
(Print Name / Signature)			
Shift P3	Gross Source cpm:	Shift D7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift M4	Gross Source cpm:	Shift P7	Gross Source cpm:
Time:	Bkg. cpm:	Time:	Bkg. cpm:
RCT Emp. #	Net Source cpm:	RCT Emp. #	Net Source cpm:
(Print Name / Signature)	% Error:	(Print Name / Signature)	% Error:
Shift D4	Gross Source cpm: 6973	% ERROR= (Net cpm/E) - Source dpm / Source dpm x 100	
Time: 0 [redacted]	Bkg. cpm: 0.1	Net cpm = gross - background cpm	
RCT Emp. # [redacted]	Net Source cpm: 6973		
[redacted]	% Error: -14.9		
(Print Name / Signature)			

E = Efficiency = 0.33 for the SAC-4 and 0.25 for the BC-4

Approved by: C N Cooper, C N Cooper [redacted] 8-22-99
Signature Emp. # Date

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RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.			
Model	SAC-4	Model	SAC-4	Model			
Serial#	835	Serial#	824	Serial#			
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due			
Bkg.	0.1 cpm	Bkg.	0.0 cpm	Bkg.			
Efficiency	33 %	Efficiency	33 %	Efficiency			
MDA	6.5 dpm	MDA	6.5 dpm	MDA			
Mfg.	Eberline	Mfg.	Eberline	Mfg.			
Model	BC-4	Model	BC-4	Model			
Serial#	700	Serial#	770	Serial#			
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due			
Bkg.	41 cpm	Bkg.	38 cpm	Bkg.		cpm	
Efficiency	25 %	Efficiency	25 %	Efficiency		%	
MDA	200 dpm	MDA	200 dpm	MDA	###	###	dpm

Survey Type: QA SWIPE SURVEY
Building: T112 A, B &C
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-16-99 Time: 14:00

RCT: Hersey / [redacted] [redacted]
Print name Signature Emp. #

RCT: Espinoza / / 516676
Print name Signature Emp. #

PRL #:

Comments:

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A ROOM 4 WALL A6*	1.5	-12		
2	T112A ROOM 6 FLOOR A1*	1.5	-20		
3	T112A ROOM 8 WALL P2*	0.0	4		
4	T112A ROOM 9 FLOOR A3*	0.0	-36		
5	T112A ROOM 11 WALL K1*	0.0	-32		
6	T112A EXTERIOR WEST WALL B1*	0.0	-28		
7	T112A EXTERIOR NORTH WALL A1*	0.0	0		
8	T112A EXTERIOR EAST WALL K3*	1.5	-20		
9	T112A EXTERIOR SOUTH WALL E3*	0.0	-48		
10	T112A EXTERIOR ROOF A2*	0.0	40	N/A	
11	T112B ROOM 1 CEILING B3*	4.5	-24		
12	T112B ROOM 2 FLOOR H1*	0.0	-20		
13	T112B EXTERIOR SOUTH WALL E2*	4.5	24		
14	T112B EXTERIOR NORTH WALL L1*	1.5	-24		
15	T112B EXTERIOR ROOF F1*	0.0	0		
16	T112C ROOM 1 FLOOR C1*	0.0	4		
17	T112C ROOM 3 WALL J2*	0.0	20		
18	T112C ROOM 5 WALL H1*	0.0	-56		
19	T112C ROOM 6 FLOOR C1*	1.5	16		
20	T112C EXTERIOR ROOF M3*	4.5	4		

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
21					
22					
223					
24					
25					
26					
27					
28					
29					
30	N/A				
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

INFORMATION ONLY

te Reviewed: _____ RS Supervision: _____ / _____ / _____
Print Name Signature Emp. #

Rev. 05/98

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	removable counts		total counts	
	alpha	beta	alpha	beta
1	1	38		
2	1	36		
3	0	42		
4	0	32		
5	0	33		
6	0	34		
7	0	41		
8	1	36		
9	0	29		
10	0	51		
11	3	35		
12	0	36		
13	3	47		
14	1	35		
15	0	41		
16	0	42		
17	0	46		
18	0	27		
19	1	45		
20	3	42		
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
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36				
37				
38				
39				
40				

INFORMATION ONLY

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.		Mfg.		Mfg.			
Model		Model		Model			
Serial#		Serial#		Serial#			
Cal Due	N/A	Cal Due	N/A	Cal Due	N/A		
Bkg.	cpm	Bkg.	cpm	Bkg.			
Efficiency	%	Efficiency	%	Efficiency			
MDA	dpm	MDA	dpm	MDA			
Mfg.		Mfg.		Mfg.	NEtech		
Model		Model		Model	Electra		
Serial#		Serial#		Serial#	1682		
Cal Due	N/A	Cal Due	N/A	Cal Due	2/4/00		
Bkg.	cpm	Bkg.	cpm	Bkg.	1	319	cpm
Efficiency	%	Efficiency	%	Efficiency	22.2	30.1	%
MDA	dpm	MDA	dpm	MDA	33	285	dpm

Survey Type: CONTAMINATION SURVEY
Building: T112B roof resurvey
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-16-99 Time: 12:00

RCT: Hersey (Print name) L Hersey (Signature)

RCT: Espinoza (Print name) Espinoza (Signature)

PRL #:

Comments: Scan Results Are Of Hi Reading In Each Grid.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta	Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	M1			185	425	21	F3			189	412
2	L1			153	352	22	E3			171	<285
3	K1			167	452	23	D3	N/A		149	309
4	J1			194	<285	24	C3			162	<285
5	I1			189	349	25	B3			158	346
6	H1			149	422	26	A3			135	<285
7	G1			167	429	27					
8	F1			131	322	28					
9	E1			162	452	29					
10	D1	N/A		171	442	30					
11	C1			167	422	31					
12	B1			171	405	32					
13	A1			185	415	33	N/A				
14	M3			167	329	34					
15	L3			153	355	35					
16	K3			162	392	36					
17	J3			153	419	37					
18	I3			171	342	38					
19	H3			149	389	39					
20	G3			167	329	40					

e Reviewed: 8/17/99 RS Supervision: S Englehard (Print Name) (Signature)

Rev. 05/98

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	SAC-4	Model	SAC-4	Model	
Serial#	835	Serial#	824	Serial#	
Cal Due	10/26/99	Cal Due	10/13/99	Cal Due	N/A
Bkg.	0.1 cpm	Bkg.	0.0 cpm	Bkg.	
Efficiency	33 %	Efficiency	33 %	Efficiency	
MDA	6.5 dpm	MDA	6.5 dpm	MDA	
Mfg.	Eberline	Mfg.	Eberline	Mfg.	
Model	BC-4	Model	BC-4	Model	
Serial#	700	Serial#	770	Serial#	
Cal Due	10/22/99	Cal Due	1/7/00	Cal Due	N/A
Bkg.	41 cpm	Bkg.	38 cpm	Bkg.	cpm
Efficiency	25 %	Efficiency	25 %	Efficiency	%
MDA	200 dpm	MDA	200 dpm	MDA	dpm

Survey Type: QA SWIPE SURVEY
Building: T112 A, B & C
Location: 280 Yard
Purpose: MARSSIM Release Survey

RWP #: N/A

Date: 08-16-99 Time: 14:00

RCT: Hersey (Print name) (Signature)

RCT: Espinoza (Print name) (Signature)

PRL #:

Comments: See individual maps of trailers for survey points

Alpha removable was a two minute count.

SURVEY RESULTS

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	T112A ROOM 4 WALL A6*	<6.5	<200		
2	T112A ROOM 6 FLOOR A1*	<6.5	<200		
3	T112A ROOM 8 WALL P2*	<6.5	<200		
4	T112A ROOM 9 FLOOR A3*	<6.5	<200		
5	T112A ROOM 11 WALL K1*	<6.5	<200		
6	T112A EXTERIOR WEST WALL B1*	<6.5	<200		
7	T112A EXTERIOR NORTH WALL A1*	<6.5	<200		
8	T112A EXTERIOR EAST WALL K3*	<6.5	<200		
9	T112A EXTERIOR SOUTH WALL E3*	<6.5	<200		
10	T112A EXTERIOR ROOF A2*	<6.5	<200		
11	T112B ROOM 1 CEILING B3*	<6.5	<200	N/A	
12	T112B ROOM 2 FLOOR H1*	<6.5	<200		
13	T112B EXTERIOR SOUTH WALL E2*	<6.5	<200		
14	T112B EXTERIOR NORTH WALL L1*	<6.5	<200		
15	T112B EXTERIOR ROOF F1*	<6.5	<200		
16	T112C ROOM 1 FLOOR C1*	<6.5	<200		
17	T112C ROOM 3 WALL J2*	<6.5	<200		
18	T112C ROOM 5 WALL H1*	<6.5	<200		
19	T112C ROOM 6 FLOOR C1*	<6.5	<200		
20	T112C EXTERIOR ROOF M3*	<6.5	<200		

Swipe #	Location/Description (Results in DPM/100CM²)	Removable Alpha	Removable Beta	Total Alpha	Total Beta
21					
22					
23					
24					
25					
26					
27					
28					
29					
30	N/A				
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

Date Reviewed: 8/17/99 RS Supervision: S Engelhard (Print Name) (Signature)

Rev. 05/98

178

Electra Performance Test Log

Instrument Serial Number: 1682

Instrument Efficiency Alpha: 22.2% Beta: 30.1%

Instrument Calibration Due Date: 2-4-00

Source Serial Number	Calibration Due Date	Source Act. (dpm)	Source Accl (cpm)	Source Acceptable Range (sq)
680141 α	N/A	24830	5512	4410 to 6615
603927 β	N/A	22723	6840	5472 to 8208
				to
				to
				to
				to
				to

Date	ALPHA BKGD3	ALPHA Reading (Corrected cpm)3	ALPHA Pass/Fail	BETA Bkgd 3	BETA Reading (Corrected cpm)3	BETA Pass/Fail	RCT Employee Number	RCT NAME (Print)	RCT Signature
8/5/99	0	4950	Pass	486	6555	Pass	[redacted]	M Munoz	
8/10/99	1	5010	Pass	526	6008	Pass		G. Hasenkamp	
8/11/99	2	5110	Pass	481	6392	Pass		G. Hasenkamp	
8/12/99	2	5170	Pass	502	7173	Pass		G Hasenkamp	
8/13/99	2	4950	Pass	507	6987	Pass		G Hasenkamp	
8/16/99	2	4940	Pass	437	6484	Pass		M Munoz	
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									
/ /									

1. Source activity in cpm is equal to the source activity in dpm multiplied by the efficiency.

2. Acceptable range is a + 20% (source activity in cpm multiplied by 0.8 or 1.2).

3. All counts are to be1 minute in duration.

REVIEWED BY: L N Cooper
RO SUPERVISOR PRINT NAME

Lotty N Cooper 8-17-99
RO SUPERVISOR SIGNATURE DATE

NOTE: If the instrument will be used for alpha measurements only, the beta portion of the test log should be lined through. If the instrument will be used for beta only, then the alpha portion should be lined through.

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Survey Area: T112	Survey Unit: Unit C	Building: T112C
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for implementation.

D. A. BARNES	[redacted]	8-3-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
H-B. ESTABROOKS	[redacted]	8/3/99
RE Peer Review Printed Name	RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

D. A. BARNES	[redacted]	8-19-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
ESTABROOKS	[redacted]	8/19/99
RE Manager Printed Name	RE Manager Signature	Date

180

13/23

Survey Area: T112	Survey Unit: Unit C	Building: T112C
Survey Unit Description: Office trailer – Pre Demolition Survey		

SAMPLING AND SURVEY INSTRUCTIONS

Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces. 5 duplicate survey points for QA purposes.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed. QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces. 5% duplicate scan areas for QA purposes.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second. QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

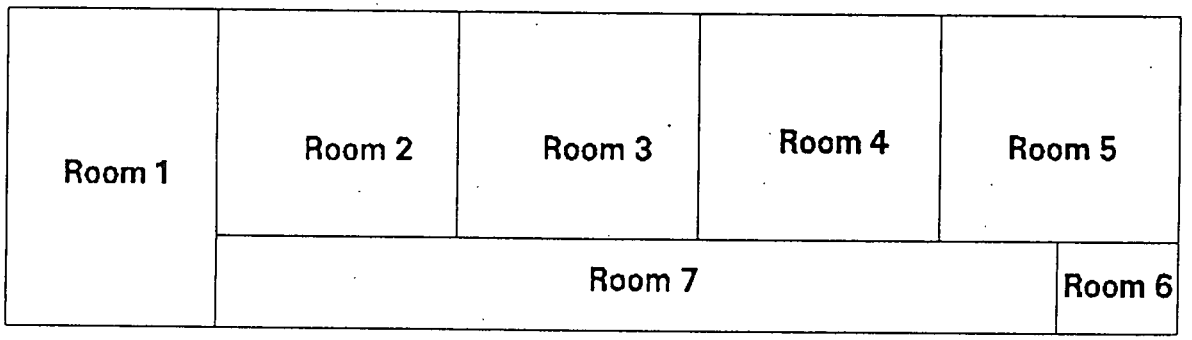
14/23

181

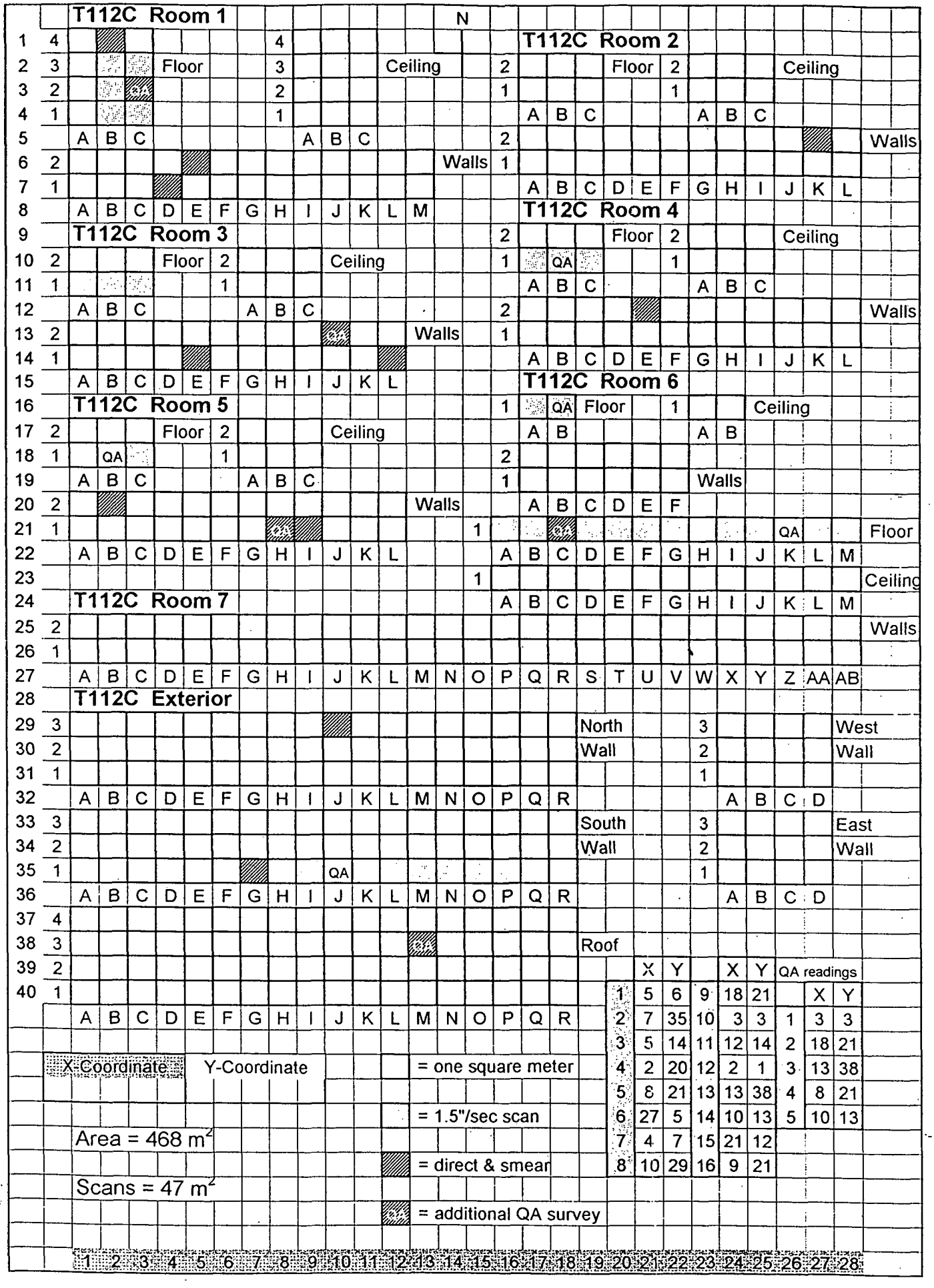
15/23

cfloorplan.xls

Building T112C Floorplan



182



	X	Y		X	Y	QA readings		
1	5	6	9	18	21		X	Y
2	7	35	10	3	3	1	3	3
3	5	14	11	12	14	2	18	21
4	2	20	12	2	1	3	13	38
5	8	21	13	13	38	4	8	21
6	27	5	14	10	13	5	10	13
7	4	7	15	21	12			
8	10	29	16	9	21			

Appendix 5

RFETS Radiological and Non-Radiological Trailer 112 A-C Characterization Package

Tomorrow's Nuclear Cleanup Today

RMRS

Rocky Flats Environmental Technology Site

Radiological and Non-Radiological Characterization Package for Trailers 112A, B, and C

July 1999

Revision 0

Marla Broussard — Date 8/4/99
RMRS Responsible Manager

Jim Moore — Date 8/4/99
RMRS Quality Assurance

Approved by:

Jeff Stevens — Date 8/4/99
Manager, D&D Advanced Planning
Kaiser-Hill Company

Table of Contents
for
Characterization Package for
Trailers T112A, T112B, and T112C

8/4/99
1255

1.0 INTRODUCTION

This Characterization Instruction is designed to describe the necessary surveys and sampling for characterization and ~~final status~~ Pre-demolition survey of RFETS Trailers T112A, B, and C in preparation for release to commerce.

2.0 CHARACTERIZATION INSTRUCTION FOR RADIOLOGICAL SURVEYS

Survey Area: T112	Survey Unit: Unit A	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for implementation.

D. A. BARNES	[redacted]		8-3-99
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
H. B. LESTABROOKS			8/3/99
RE Peer Review Printed Name		RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date
RE Manager Printed Name	Employee #	RE Manager Signature	Date

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4/23

Survey Area: T112	Survey Unit: Unit A	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SAMPLING AND SURVEY INSTRUCTIONS

Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

5/23

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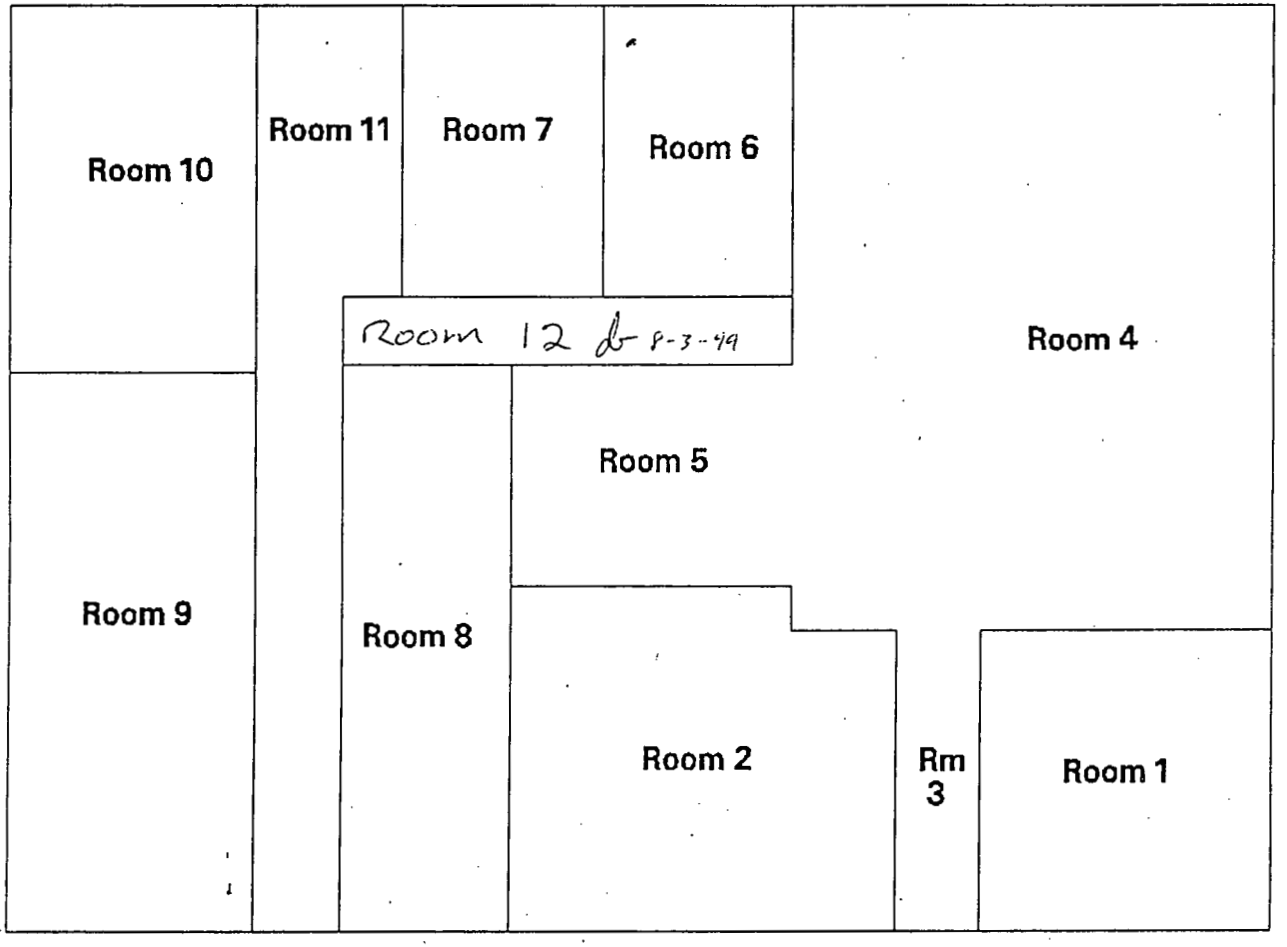
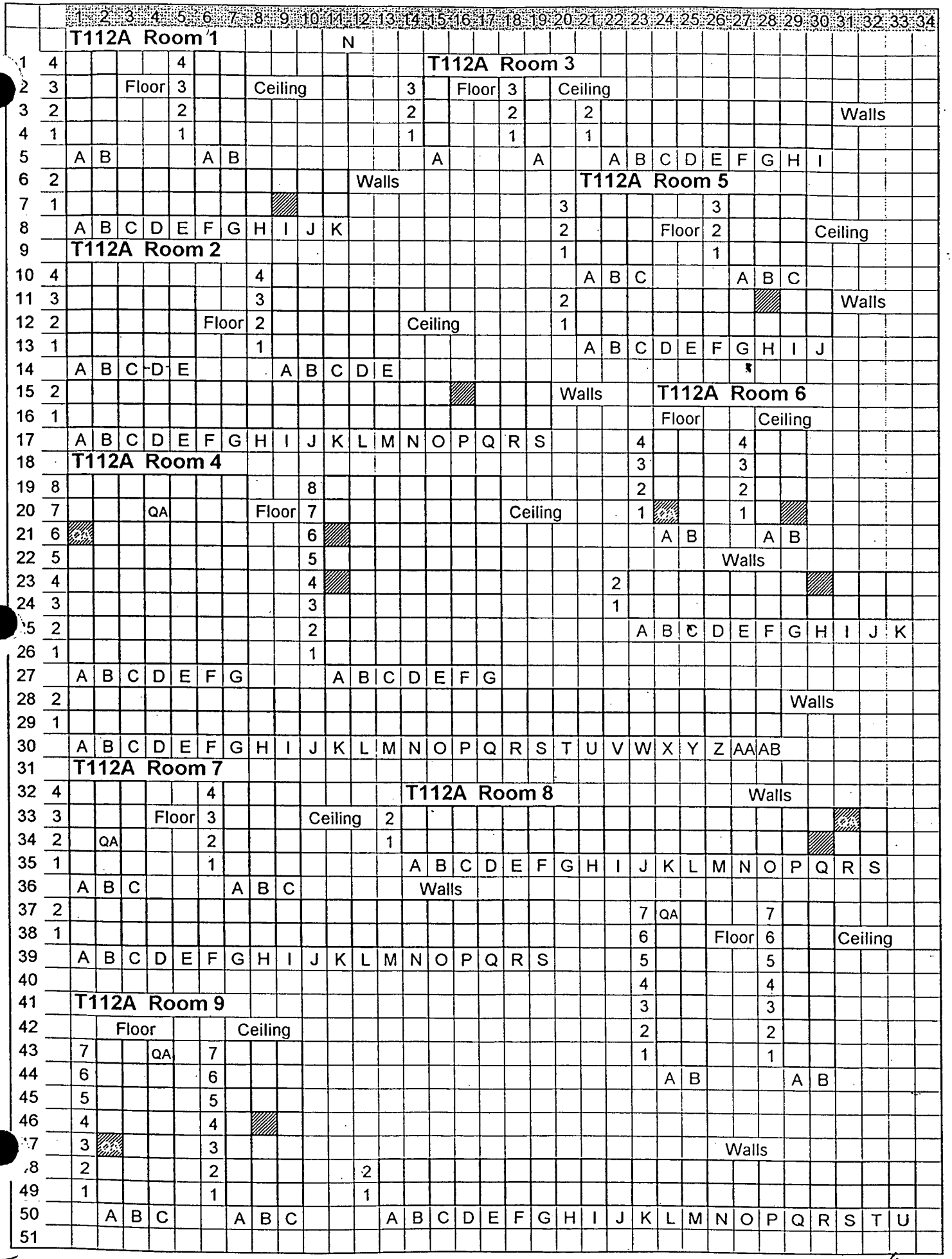
6/03

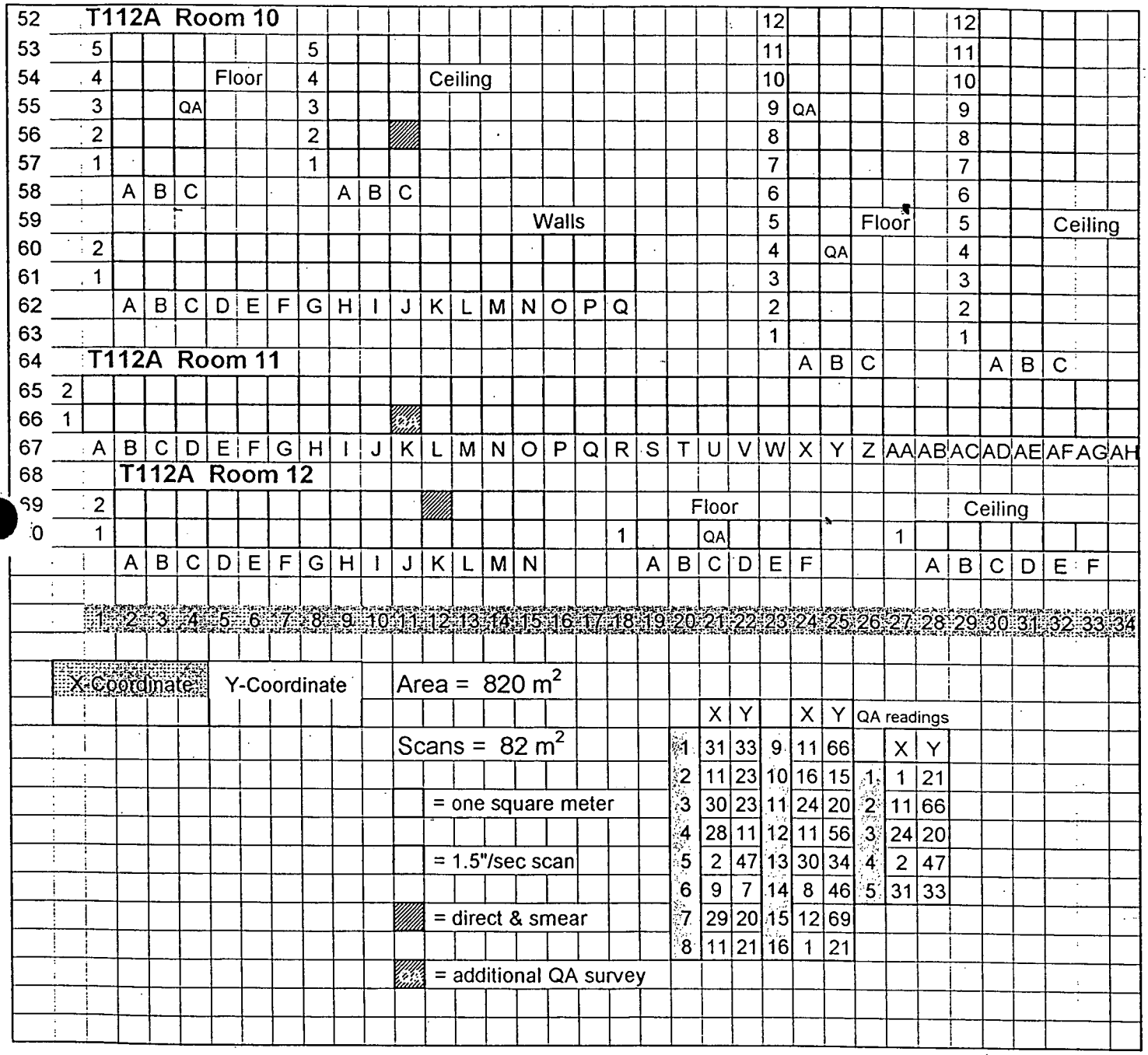
afloorplan.xls

Building T112A Floorplan




T112A Room 1
T112A Room 3
T112A Room 5
T112A Room 2
T112A Room 6
T112A Room 4
T112A Room 7
T112A Room 8
T112A Room 9
Floor
Ceiling
Walls
QA
N

7/23



	X	Y		X	Y
1	31	33	9	11	66
2	11	23	10	16	15
3	30	23	11	24	20
4	28	11	12	11	56
5	2	47	13	30	34
6	9	7	14	8	46
7	29	20	15	12	69
8	11	21	16	1	21

	X	Y
1	1	21
2	11	66
3	24	20
4	2	47
5	31	33

8/23

Survey Area: T112	Survey Unit: Unit B	Building: T112B
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for imple[redacted]

D. A. BARNES		8-3-99
Radiological Engineer Printed Name	Radiological Engineer Signature	Date
H. B. ESTABROOKS		8/3/99
RE Peer Review Printed Name	RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date
RE Manager Printed Name	Employee #	RE Manager Signature	Date

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9/23

Survey Area: T112	Survey Unit: Unit B	Building: T112B
Survey Unit Description: Office trailer – Pre Demolition Survey		

SAMPLING AND SURVEY INSTRUCTIONS

Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

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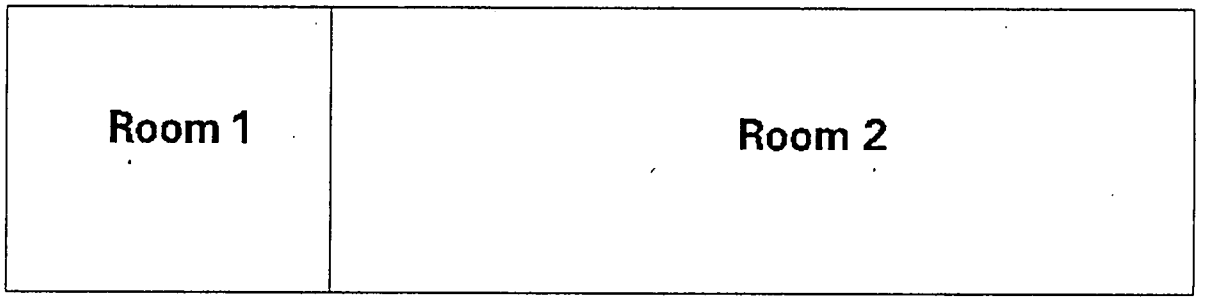
10/23

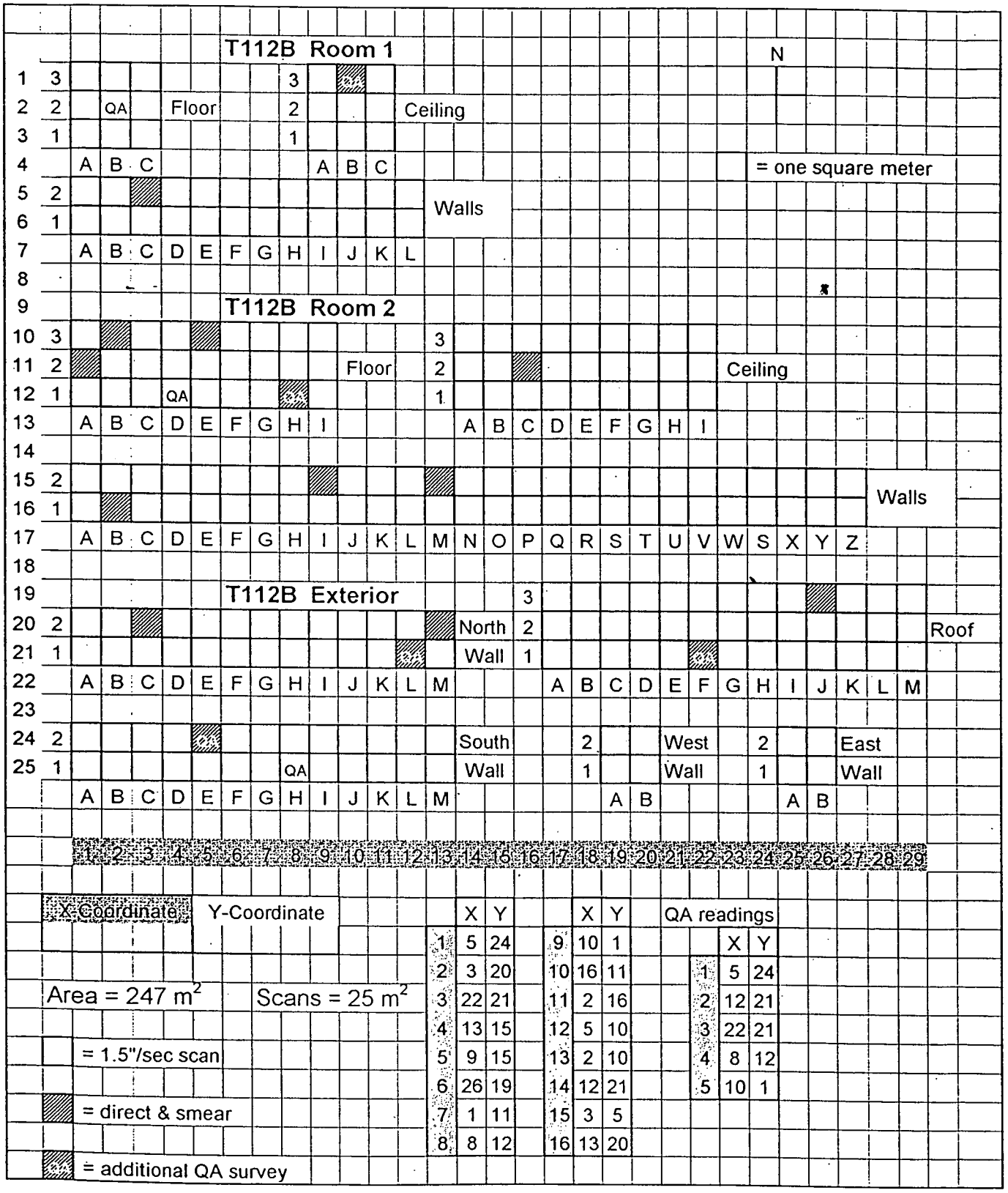
11/23

bfloorplan.xls

Building T112B Floorplan



112 Trailers PDS
Unit B - T112B
SURVEY POINTS



	X	Y
1	5	24
2	3	20
3	22	21
4	13	15
5	9	15
6	26	19
7	1	11
8	8	12

	X	Y
9	10	1
10	16	11
11	2	16
12	5	10
13	2	10
14	12	21
15	3	5
16	13	20

	X	Y
1	5	24
2	12	21
3	22	21
4	8	12
5	10	1

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12/23

Survey Area: T112	Survey Unit: Unit C	Building: T112C
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for implementation

D. A. BARNES	[redacted]		8-3-99
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
H. B. ESTABROOKS			8/3/99
RE Peer Review Printed Name		RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date
RE Manager Printed Name	Employee #	RE Manager Signature	Date

198

13/23

Survey Area: T112	Survey Unit: Unit C	Building: T112C
Survey Unit Description: Office trailer – Pre Demolition Survey		

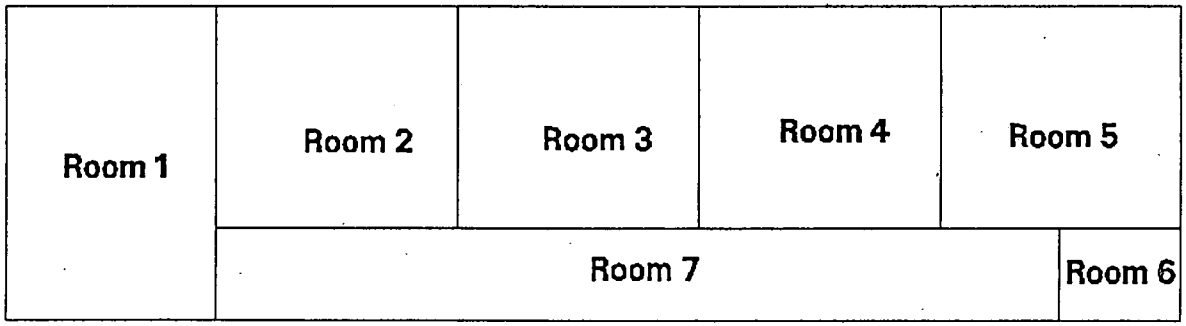
SAMPLING AND SURVEY INSTRUCTIONS

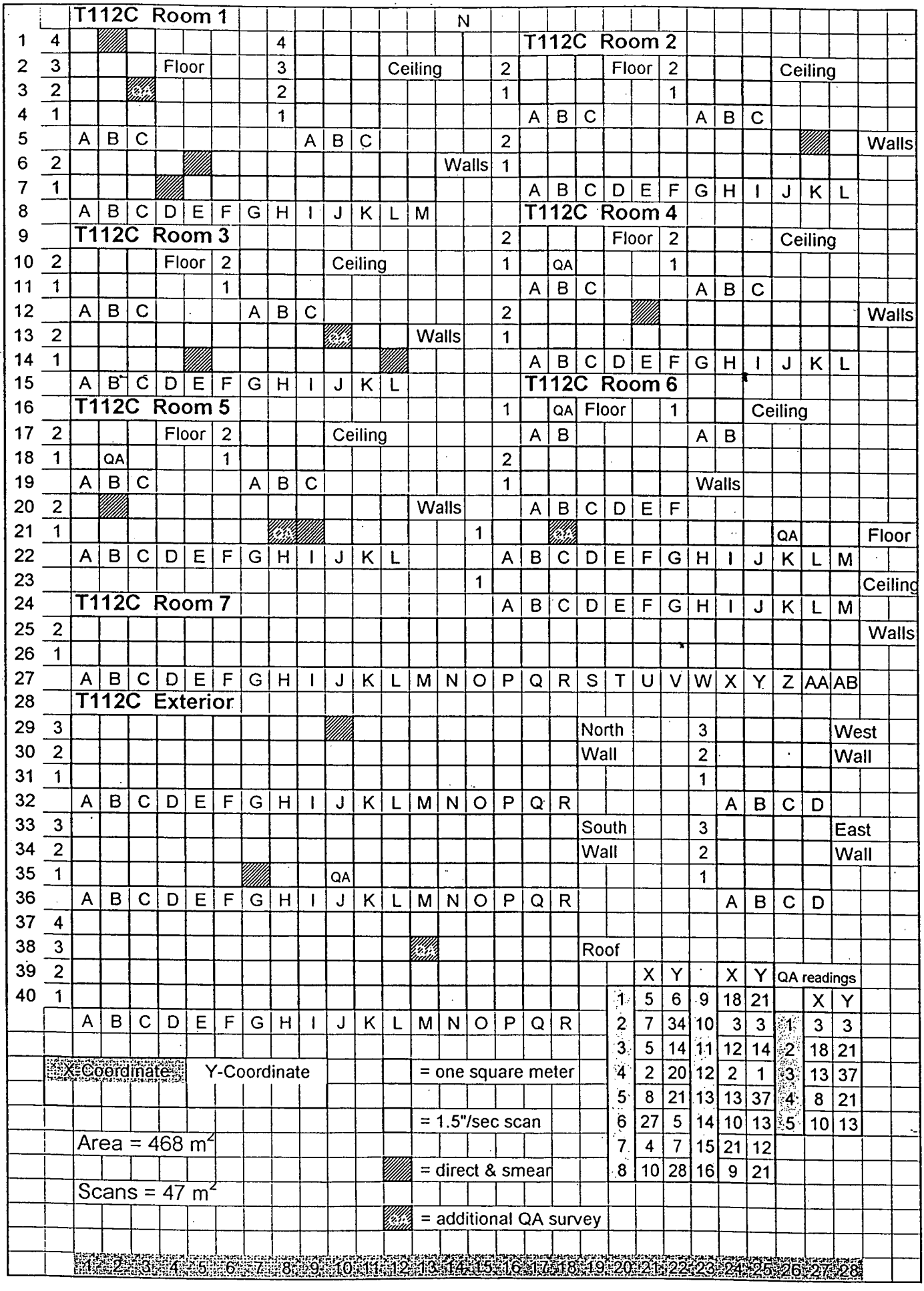
Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None

15/23

cfloorplan.xls

Building T112C Floorplan





	X	Y		X	Y
1	5	6	9	18	21
2	7	34	10	3	3
3	5	14	11	12	14
4	2	20	12	2	1
5	8	21	13	13	37
6	27	5	14	10	13
7	4	7	15	21	12
8	10	28	16	9	21

QA readings		
	X	Y
1	3	3
2	18	21
3	13	37
4	8	21
5	10	13

201

16123

Survey Area: T112	Survey Unit: Unit D	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SURVEY PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☐ _____

Special Support Requirements

Survey points randomly generated by Radiological Engineering

Special Safety Precautions

Per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP

Labeling Requirements

Not Applicable

Survey Package Implementation

This survey package is ready for implementation.

D. A. BARNES	[redacted]		8-3-99
Radiological Engineer Printed Name		Radiological Engineer Signature	Date
H. B. ESTABROOKS			8/3/99
RE Peer Review Printed Name		RE Peer Review Signature	Date

Survey Package Closure

All required reviews are complete, and data analysis results meet RLCP criteria. Survey package is authorized for closure.

Radiological Engineer Printed Name	Employee #	Radiological Engineer Signature	Date
RE Manager Printed Name	Employee #	RE Manager Signature	Date

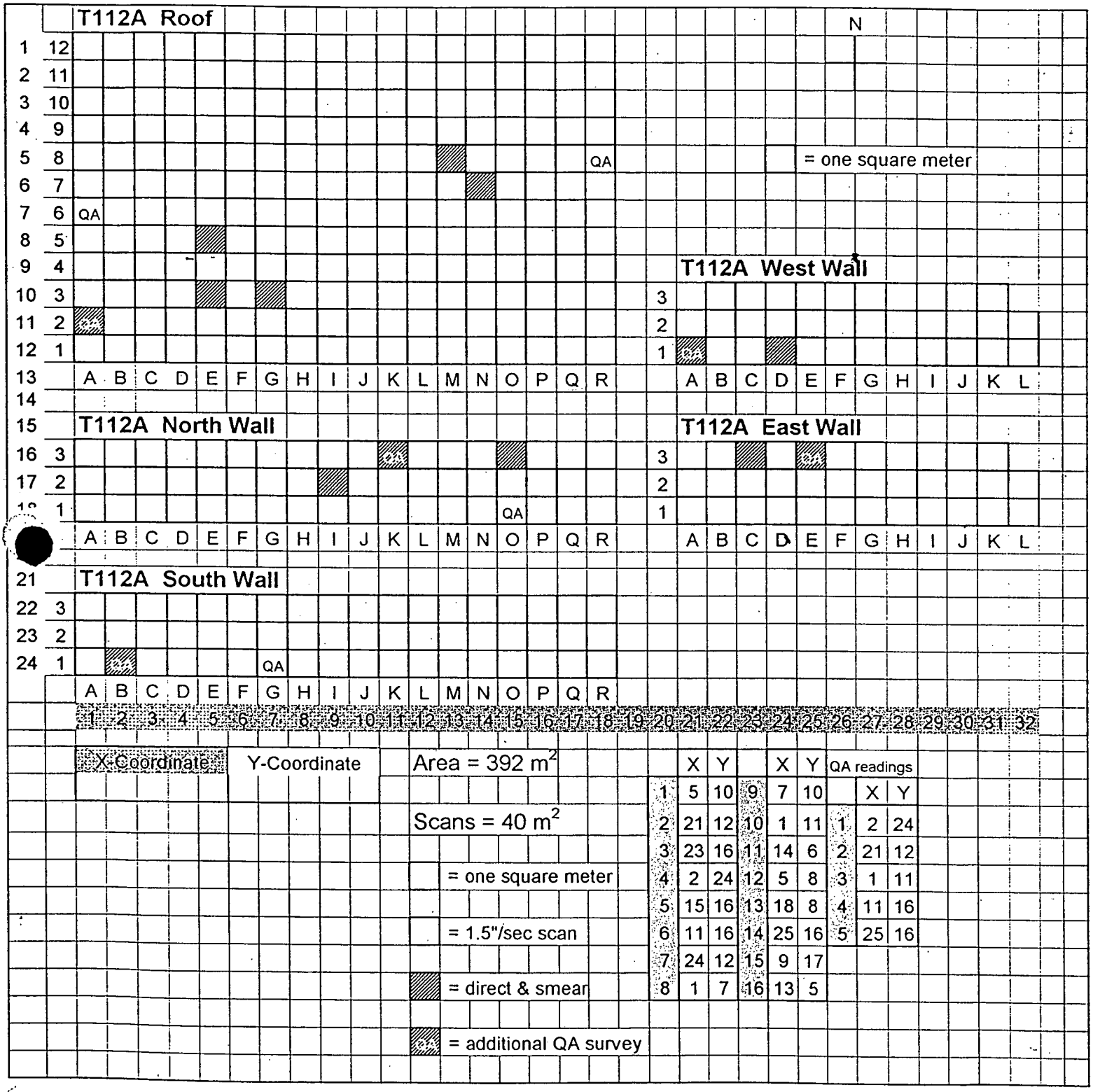
202

17/23

Survey Area: T112	Survey Unit: Unit D	Building: T112A
Survey Unit Description: Office trailer – Pre Demolition Survey		

SAMPLING AND SURVEY INSTRUCTIONS

Minimum Survey & Sample Measurement Requirements		
Measurement	**Amount & Type**	**Comments**
Surface Activity Measurements:	16 survey points (alpha & beta, direct & removable) on trailer surfaces.	Representative surveys of the area will be taken for total and removable, alpha and beta contamination in accordance with 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements" and IWCP The RCT will document the readings of all surveys performed.
	5 duplicate survey points for QA purposes.	QA survey points done by different RCT Duplicate smears will be taken at a directly adjacent location.
Surface Scanning:	10% scan surveys on trailer surfaces.	1 m^2 scan surveys will be performed at locations indicated. Scan surveys of the area will be taken for alpha and beta contamination at a scan rate of 1.5 inches per second.
	5% duplicate scan areas for QA purposes.	QA scan areas done by different RCT
Media Samples:	None	None
Volumetric Samples:	None	None



	X	Y		X	Y
1	5	10	9	7	10
2	21	12	10	1	11
3	23	16	11	14	6
4	2	24	12	5	8
5	15	16	13	18	8
6	11	16	14	25	16
7	24	12	15	9	17
8	1	7	16	13	5

QA readings		
	X	Y
1	2	24
2	21	12
3	1	11
4	11	16
5	25	16

19/23

3.0 CHARACTERIZATION INSTRUCTION FOR NON-RADIOLOGICAL SAMPLING

NON-RADIOLOGICAL CHARACTERIZATION PACKAGE COVER SHEET

Building Information

Classification: Type 1 ☒ Type 2 ☐ Type 3 ☐

Contaminants of Concern: Plutonium ☒ Uranium ☒ Other ☒ RCRA Constituents, Lead, Beryllium, PCBs, Asbestos

Special Support Requirements

None.

Special Safety Precautions

None.

Labeling Requirements

None.

Characterization Instruction Implementation

This survey package is ready for implementation. Adequate detail is provided satisfy DQO's. These DQO's and data evaluation requirements are covered in the *Decontamination and Decommissioning Characterization Protocol*, MAN-077-DDCP.

Paul A. Wojtaszek	[redacted]	Paul A Wojtaszek	08/04/99
Preparer Printed Name		Preparer Signature	Date
Jim Moore		Jim H. Moore	8/4/99
Reviewer Printed Name		Reviewer Signature	Date

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21/23

SAMPLING AND SURVEY INSTRUCTIONS

Sampling Requirements: No sampling for non-radiological contaminants is required for this characterization. All characterization for non-radiological contaminants will be done using historical data.

Measurement	Amount & Type	Comments
RCRA constituents	None	According to historical data and process knowledge, no chemicals were used or stored in any of the three trailers (*D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report*). Therefore, **sampling for chemical contaminants is unnecessary and will not be conducted.**
Lead (Pb) in paint	None	Wooden stairs and platforms have been attached to the trailers and are coated with paint which has not been characterized for Pb content. These stairs and platforms will be disposed of as waste. However, Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, has directed that LBP debris generated outside of currently identified HCA's shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. Therefore, analysis of Pb in paint from wooden stairs and platforms is unnecessary and will not be conducted. The paint on the interior and exterior surfaces of the trailers has not been characterized for Pb in paint. Such characterization is not required for release of the trailers to commerce. Therefore, **analysis of Pb in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.**
Beryllium	None	There is no record of beryllium operations or storage being carried out in any of the three trailers (*D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report,* and *List of Known Beryllum Areas*). Additionally, these trailers have been used as administrative office space since their arrival on site, and the *RFETS Administrative Equipment Characterization for Beryllium Contamination Project Plan Report* showed no detectable beryllium contamination in the 60 RFETS buildings with no record of beryllium activities that were studied. However, since T112 A, B, and C were not included in that study,

		the CBDPP conducted an independent beryllium survey of T112A, which confirmed absence of detectable beryllium contamination. The results of this survey will be included in the T112 RLCR. **No additional beryllium sampling will be conducted as part of this characterization package.**
Polychlorinated biphenyls (PCBs)	None	A high voltage electrical power transformer is mounted on a concrete pad outside the southwest corner of T112A, and is labelled "No PCBs." There is no record of PCB use or storage in any of the trailers (*D&D Facility Characterization Interview Checklist and Attached Facility Checklist and HRR Manager's Report*). Therefore, **analysis for PCBs within the trailers is unnecessary and will not be conducted.** Wooden stairs and platforms have been attached to the trailers and are coated with paint which has not been characterized for PCB content. These stairs and platforms will be disposed of as waste. However, Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761.3 and 40 CFR 761.62 paragraph (b) and therefore need not be sampled as long as restrictions outlined in 40 CFR 761.62 regarding their disposal are met. Additionally, while the paint on the interior and exterior surfaces of the trailers has not been characterized for PCBs in paint, such characterization is not required for release of the trailers to commerce. Therefore, **analysis of PCBs in paint from the interior and exterior surfaces of the trailers is unnecessary and will not be conducted.**
Asbestos	None	Historical asbestos inspection data exist for T112 A,B, and C. Thirteen samples of floor tile, wall, and ceiling material were taken in T112A, and of these, 4 floor tile samples were determined to be asbestos-containing. Six samples of floor tile, wall, and ceiling material were taken in T112B, and of these, 1 floor tile sample was determined to be asbestos-containing. Nine samples of floor tile, wall, and ceiling material were taken in T112C, and no asbestos was detected. For release to commerce, this information must be disclosed, but further characterization is unnecessary. Therefore, **no further asbestos inspection or sampling will be conducted.**

Appendix 6

Final Sampling: Analysis Plan For Roofing Material from Trailers T112A and T112B for Isotopic Analysis, (RF/RMRS-99-332)

PW 07/21/99

KAISER-HILL COMPANY

RMRS Rocky Mountain Remediation Services, L.L.C. ...protecting the environment

Final
Sampling and Analysis Plan for Roofing Material from Trailers T112A and T112B for Isotopic Analysis

RF/RMRS-99-332

JUL 21 1999

Environmental Restoration
Rocky Flats Environmental Technology Site

July 21, 1999

210

This is a
CONTROLLED DOCUMENT
ROCKY FLATS PLANT
This is a RED stamp
COPY HOLDER NO. 601

Administrative Information

Site: Rocky Flats Environmental Technology Site
Golden, Colorado

Project Name: Sampling of Roofing Material From Trailers T112A and T112B for Isotopic Analysis

Date Prepared: July 20, 1999

Date Effective: July 21, 1999

Approvals

I have read and approved this sampling and analysis plan with respect to the objectives of the project.

Paul A Wojtaszek 07/21/99
Paul A. Wojtaszek
Project Manager, Document Co-Author

7/21/99
Hopi Salomon
Document Peer Review

7/21/99
Dave Barnes
Radiological Engineer, Document Co-Author

7/21/99
Greg DiGregorio
RMRS Quality Assurance

7/21/99
Marla Broussard
Manager, Characterization

1.0 INTRODUCTION

Trailer T112A was assembled at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112, in the early 1960's. The size of the T112A is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' in size. The siding and the skirting (which is approximately 28" high) consists of enamel on aluminum. The trailer is structurally sound. The foundation is concrete blocks and the tie down method for the unit is steel cable from the trailer's I-beam secured to concrete caissons. T112A is unoccupied at the present time, but has previously served as office space for a travel office, transportation security scheduling office, and company store.

Trailer T112B was moved to Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1990 or 1991 from the Bldg. 771 trailer park. At this time the interior was refurbished. T112B has a nearly full length wooden deck with a sloped roof on its south side. The siding and the skirting consists of enamel on aluminum. It has served as a site for folding laundry, telecommunications office space, and storage of telecommunications equipment. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Trailer T112C was put in place at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1991. The entryways are covered by wooden panels. The siding and the skirting consists of enamel on aluminum. It has served as office space for the Wackenhut scheduling office. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Asbestos characterization data exist for the interior of both trailers, and show asbestos in the floor tile mastic. Hazardous chemicals were not known to be used or stored in these trailers. The tailers have not been characterized for use of lead-based paint.

The purpose of this Sampling and Analysis Plan (SAP) is to collect data to satisfy data gaps regarding radiological contamination of the roofing material of T112A and T112B.

Due to past RFETS experience with the unrestricted release of similar structures it is considered prudent to obtain two media samples each from the roofing material of both T112A and T112B, for a total of four samples. Samples will be taken by the RFETS CAS sample team in accordance with CAS SOP-003, *Commodore Advanced Sciences, Waste Characterization Procedure*, and section 3.1.1.2 of the Pre-Demolition Survey Plan, excerpted in Section 3.0, *Sample Collection and Analysis*.

2.0 DATA QUALITY OBJECTIVES

Decisions must be made as to whether Trailers T112A, T112B, and T112C are radiologically contaminated or eligible for free-release from the site. These decisions will be based on both radiological surveys and radiochemistry samples. This SAP and the DQOs within it only address the radiochemical characterization needs of the project, as radiological surveys shall be covered in a separate characterization package. Further, radiochemistry samples must be collected at the earliest possible time in the project to comply with the project's schedule constraints. Based on visual inspections and historical use of the trailers for administrative purposes only, potential of chemical hazards within or on the trailers has been ruled-out.

The Problem

The quantity and types of radioactivity and radioactive contamination present in and on the trailer are not known with adequate confidence to ensure compliance with free-release criteria; therefore, adequate measurements must be taken to properly characterized the trailers as contaminated or not contaminated. All areas of the trailer shall be characterized through radiological surveys; however, actinides of interest within bulk material on two of the trailer rooftops (Trailers 112A and 112B) must be established through radiochemical analysis because initial radiological surveys (fixed contamination) indicate contamination, but based on site history and process knowledge, naturally-occurring radionuclides (not of DOE origin) are suspected.

Identification of Decisions

What types and quantities of radioactive contamination exist in the bulk matrix of roofing materials, and if present, is contamination above or below free-release levels for the actinides of interest?

Inputs to the Decisions

Inputs to the decision rule include

- radiochemistry results (Pu-239/40, Am-241, U-233/234, U-235, and U-238) from the four samples of interest -- 2 from Trailer 112A and 2 from Trailer 112B,
- quality assurance aspects of the data, including precision, accuracy, representativeness, completeness, and comparability (i.e., the PARCC parameters),
- gross alpha & beta (for DOT shipping limits and compliance),
- unrestricted release criteria (1-P73-HSP-18.10, Appendix 1).

Radiological instrumentation planned for the project is controlled by K-H Analytical Services Division through contractual requirements with onsite and offsite (radiochemistry) vendors. All instrument sensitivities are adequate for producing results comparable to free-release action levels and compliance with DOT requirements.

Definition of the Boundaries

Three-dimensional boundaries for defining the levels and extent of radioactive contamination are given restricted to the Trailer rooftop exteriors referenced above.

There are no temporal boundaries relative to technical data quality; time constraints depend only on project schedule.

Decision Rules
After conversion of radiochemistry concentrations (from bulk samples) to dpm/100 cm^2, if the sum-of-ratios of the collective suite of actinides is less than unity (1) for each sample (using the Appendix 1, 1-P73-HSP-18.10 [based on DOE Order 5400.5] free-release level of 100 dpm/100cm2 in the denominator of each ratio), the associated rooftop contains no DOE-added radiological contamination; otherwise, the rooftop material is contaminated and is considered low-level waste.

The use of this decision rule has precedence through its implementation by radiological engineering on the Building 779 Decommissioning Project, and subsequent approval of the methodology and results by DOE RFFO, CDPHE, and EPA Region VIII.

Limits on Decision Errors
Based on homogeneity of the bulk material in question, a statistical sampling of the roofs in not necessary, and thus statistical error on the sample set results is not applicable. Random counting errors that are actinide- and sample-specific will be reported with all results, and are typically <10% at elevated levels and <20% at levels near the MDC.

Optimization of the Sampling Design
If results indicate contamination levels greater than free-release levels, additional samples will be planned to better characterize the trailers in total.

3.0 SAMPLE COLLECTION AND ANALYSIS

T112A is constructed with a tar paper roof that has been painted at some time after installation with a heat reflective paint.

T112B has a heavily oxidized metal roof. Previous surveys of site trailers of similar age and construction have exhibited high alpha count rates due to the deposit of naturally occurring radioactive materials (such as Po-210 or radon daughters) in this porous oxide layer.

For each trailer (T112A and T112B), two locations will be selected by Radiological Engineering based on experience and professional judgement. A minimum of 125 gm is required for each analytical sample, and an additional 125 gm is required for the accompanying radscreen sample at each sample location. The radscreen sample will be taken immediately adjacent to the analytical sample. The individual weight of all samples will be determined using a calibration-certified scale and recorded. The samples will consist of square or rectangular sections with a surface area of a minimum of 100 cm^2, and this surface area will be measured with a ruler or tape measure and recorded. These samples will be sent to an off site laboratory and analyzed for the five RFETS isotopes of concern (Pu-239/40, Am-241, U-233/234, U-235, and U-238) to ensure that no DOE

radioactive material is trapped beneath the heat reflective paint. The analytical laboratory Statement of Work will be modified such that the complete sample is tare weighed and digested, and that in addition to providing a concentration-based result (i.e., pCi/gm), the laboratory will be required to provide a total activity per isotope for the entire sample.

Pre-sampling and post-sampling radiological surveys will be required.

> **NOTE:** T112C, which is also located in the vicinity of T112A and T112B, is the youngest of the three trailers and has a rubberized textile roof that is in good condition. Little or no alpha activity is anticipated. Its roof will not be sampled since previous survey activities exhibited activity less than DCGLs.

Samples will be collected using the sampling techniques described in CAS SOP-003, *Commodore Advanced Sciences, Waste Characterization Procedure*. Roofing material will be removed utilizing a utility knife or tin snips, as required by the material. A water spray mist will be used as necessary in order to prevent generation of dust, due to the (low) potential for asbestos in the roofing material. No asbestos characterization of the roof will be performed. Glass sample jars will be used to collect samples, and signed custody seals will be applied after sample collection. Quality control samples, such as rinsates, duplicates, and trip blanks, are not required for this effort.

4.0 SAMPLE DESIGNATION

Each sample will be assigned a unique number in accordance with the RFETS Analytical Services Division (ASD) requirements. The unique sample number will be broken down into the following three parts:

- Report Identification Number (RIN)
- Event Number
- The Bottle Number

The first part of the number will be the RIN, which is assigned by the ASD. The RIN is used by the ASD to track and file analytical data. It is expected that one RIN will be assigned, however, if the project is not completed quickly, ASD may assign additional RINs. The RIN will be a seven digit alphanumeric code starting with "99" for 1999. The RIN will be followed by a dash "-" and then the event number. The event number is a three digit code, starting with "001" under the RIN, and will be sequential. Each typical sample location will have a unique event number under the RIN. The event number will be followed by a period "." and then the sequential bottle number. The bottle number will be used to identify individual sample containers collected at the same location and same event number.

In addition to the sample numbering scheme above, additional information will be collected with respect to each sample. This additional information will include:

- Sample type
- Location code

5.0 SAMPLE HANDLING AND DOCUMENTATION

Sample custody will be maintained and documented using RFETS chain of custody forms. Sampling equipment (e.g., utility knife, tin snips) will be decontaminated between sampling locations. Decontamination will be performed using a spray rinse of distilled or deionized water followed by wiping with a Kimwipe™. The sampling tool will then be visually verified free of contamination, prior to its next use. Sampling information shall be documented on field log sheets or notebook. The originator shall authenticate (legibly sign and date) each completed hardcopy of the data. A peer reviewer, someone other than the originator, shall perform a review of the logsheet/notebook. The peer reviewer shall authenticate each hardcopy completed by the originator. Any modifications shall be lined-through, initialed, and dated by the reviewer (in ink). The QA Records for the project include the field log sheet and chain-of-custody forms.

6.0 PROJECT ORGANIZATION

Table 6-1 lists the responsible personnel assigned to this project, their responsibilities and contact information.

Table 6-1 Personnel Supporting the T112 A and T112B Roofing Characterization

Name	Responsibility	Phone	Pager	Radio
Paul Wojtaszek	Project Manager	3125	None	3723
Dave Barnes	Radiological Engineer	5352	212-6541	3759
Dave Farler	Industrial Hygiene	4340	212-6555	3734
Dan Lippencott William Santiago Michelle Hershey	Commodore Sample Team	5267	212-3129	3502
Greg DiGregorio	Quality Assurance	5688	212-6206	none
Marla Broussard	Characterization Manager	6007	212-6261	none
Stan Jablkowski	Radiological Control Technician	2397	none	none
Letty Cooper	Radiological Operations Supervisor	2397	212-2333	3208

Appendix 7

Historical Inspection Report for T112A

T112A

NVLAP LAB NO. 1896

LAB I.D. 10768

ASBESTOS - TEM, PCM, PLM, SEM
METALS - AA, FLAME/FURNACE
AIRBORNE PARTICULATES
SPECIAL PARTICLE ANALYSIS

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

1827 GRANT STREET DENVER, COLORADO 80203 (800) 678-7374 (303) 830-1986 FAX (303) 863-9196

July 18, 1994

Ms. Julie Linkus
EG&G Rocky Flats Plant
PO Box 464
Golden, CO 80402-0464

RE: Job No. RES 20768 - 23586JL/147A - Bulk Samples: 112A9407137301, 112A9407137302, 112A9407137303, 112A9407137304, 112A9407137305, 112A9407137306, 112A9407137307, 112A9407137308, 112A9407137309, 112A9407137310, 112A9407137311, 112A9407137312 and 112A9407137313.

Dear Ms. Linkus:

Reservoirs Environmental Services, Inc. (RES, Inc.) has analyzed 13 bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on July 14, 1994, and initial results were telephoned to your office on July 18, 1994. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763, Subpart F, Appendix A). The Analytical Results are presented in Table I.

RES, Inc. has assigned job number RES 20768 to this study. This report is considered highly confidential and the sole property of EG&G Rocky Flats Plant. RES, Inc. will not discuss any part of this study with personnel other than those of the client company. Samples will be disposed of after sixty days unless longer storage is requested. The US EPA guideline (40 CFR Part 763, Subpart F, Appendix A) was developed for use on friable building materials and is not recommended for non-friable materials such as floor tiles. RES, Inc. recommends additional analyses to confirm negative PLM results on floor tiles.

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20768
Client: EG&G Rocky Flats Plant
Client Project: 23586JL/147A,
Date Samples Received: July 14, 1994
Analysis Type: PLM Short Report
Turnaround: 3-5 Day

Client Sample Number	Lab ID Number	TOTAL ASBESTOS (%)	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	Non-Fibrous Components (%)
112A9407137301	EM 128531	ND	A	Tan paint	3		ND	0	0	0	0	0	0	100
			B	Tan & brown fibrous material	12		ND	97	0	0	0	0	0	3
			C	White fibrous plaster	85		ND	10	0	0	0	0	0	90
112A9407137302	EM 128532	ND	A	Tan paint	3		ND	0	0	0	0	0	0	100
			B	Tan & brown fibrous material	12		ND	97	0	0	0	0	0	3
			C	White fibrous plaster	85		ND	10	0	0	0	0	0	90
112A9407137303	EM 128533	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
			B	Brown fibrous material	95		ND	97	0	0	0	0	0	3
112A9407137304	EM 128534	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
			B	Brown fibrous material	95		ND	97	0	0	0	0	0	3
112A9407137305	EM 128535	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
			B	Tan fibrous material	95		ND	97	0	0	0	0	0	3
112A9407137306	EM 128536	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
			B	Tan fibrous material	95		ND	97	0	0	0	0	0	3
112A9407137307	EM 128537	ND	A	White paint	5		ND	TR	0	0	0	0	0	100
			B	Tan fibrous material	95		ND	97	0	0	0	0	0	3
							ND	0	0	0	0	0	0	100

ND = None Detected
TR = Trace
CELL = Cellulose
Mat = Material
ORG = Organic
BRUC = Brucite
WOLL = Wollastonite
Trem-Act = Tremolite-Actinolite
GYP = Gypsum
SYNTH = Synthetic

Analyst: BG

Data QA

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RESERVOIRS ENVIRONMEI SERVICES, INC.

NVLAP Accredited Laboratory 896

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20768
Client: EG&G Rocky Flats Plant
Client Project: 23586JL/147A,
Date Samples Received: July 14, 1994
Analysis Type: PLM Short Report
Turnaround: 3-5 Day

Client Sample Number	Lab ID Number	TOTAL ASBESTOS (%)	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	Non-Fibrous Components (%)
112A9407137308	EM 128538	ND	A	Gray resin	5		ND	0	0	0	0	0	0	100
			B	Tan fibrous woven material w/tan resin	20		ND	98	0	0	0	0	0	2
			C	Gray fibrous woven material w/multicolored fibrous woven material	75		ND	0	0	95	0	0	0	5
112A9407137309	EM 128539	1.8	A	Gray resinous material	5		ND	0	0	0	0	0	0	100
			B	Tan resin	7		ND	0	0	0	0	0	0	100
			C	Tan fibrous woven material	8		ND	98	0	0	0	0	0	2
			D	White tile	15	Chrysotile	12	0	0	0	0	0	0	88
			E	Silver metalic	25		ND	0	0	0	0	0	0	100
			F	Multicolored fibrous woven material	40		ND	0	0	99	0	0	0	1
112A9407137310	EM 128540	1.8	A	Black fibrous tar	7	Chrysotile	25	5	TR	0	0	0	0	70
			B	Tan resin	8		ND	0	0	0	0	0	0	100
			C	Tan fibrous resinous material	25		ND	40	5	20	0	0	0	35
			D	Multicolored resinous tile	60		ND	0	0	0	0	0	0	100

ND = None Detected
TR = Trace
CELL = Cellulose
Mat = Material
ORG = Organic
BRUC = Brucite
WOLL = Wollastonite
Trem-Act = Tremolite-Actinolite
GYP = Gypsum
SYNTH = Synthetic

Data QA

220

ABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

ES Job Number: RES 20768
lient: EG&G Rocky Flats Plant
lient Project: 23586JL/147A,
ate Samples Received: July 14, 1994
nalysis Type: PLM Short Report
urnaround: 3-5 Day

Client Sample Number	Lab ID Number	TOTAL ASBESTOS (%)	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	Non-Fibrous Components (%)
12A9407137311	EM 128541	0.9	A	Black fibrous tar	3	Chrysotile	30	5	TR	0	0	0	0	65
			B	Tan & brown resin	7		ND	0	0	0	0	0	0	100
			C	Tan fibrous resinous material	25		ND	45	10	10	0	0	0	35
			D	Multicolored resinous tile	65		ND	0	0	0	0	0	0	100
12A9407137312	EM 128542	ND	A	Tan fibrous material	3		ND	98	0	0	0	0	0	2
			B	Tan resin	7		ND	0	0	0	0	0	0	100
			C	White & tan tile	90		ND	0	0	0	0	0	0	100
12A9407137313	EM 128543	2.7	A	Black tar	10		ND	TR	0	0	0	0	0	100
			B	White & tan tile	90	Chrysotile	3	0	0	0	0	0	0	97

D = None Detected
R = Trace
CELL = Cellulose
Mat = Material
ORG = Organic
BRUC = Brucite
WOLL = Wollastonite
Trem-Act = Tremolite-Actinolite
GYP = Gypsum
SYNTH = Synthetic

Data QA

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1. Sample (Bldg-Y-M-D-P#-S#)

1 1 2A 9 4 0 7 1 3 7 3 0 1 ☐ SINGLE

1 1 2A 9 4 0 7 through 1 3 7 3 ___ ☒ MULTIPLE

ROCKY FLATS PLANT
INDUSTRIAL HYGIENE BULK SAMPLE FORM

2. Process Title:

3. Subprocess Title:

4. Building/OU Etc.: T 112A

5. Chain of Custody Seal #:

6. Analytical Sample Method: PLM

7. Lab Report #:

8. Lab Method:

9. Related Forms:

10. Sample # (Bldg-Y-M-D-P#-S#)	11. Location Information	12. Material Type	13. Bulk Sample Description	14. Results
		(lower left cave)		
112A9407137301	Wall - SW Corner (near water cooler)	misc		
112A9407137302	Wall - East South Middle (Between east rooms		RG 6	
112A9407137303	Ceiling - near light (East)		RG 6	
112A9407137304	Ceiling - above doorway near Exit sign		RG 6	
112A9407137305	Ceiling - East (near window)		RG 7	
112A9407137306	Ceiling		RG7	
~~112A9407137306~~	~~Ceiling~~ dup		~~RG~~ (dup)	
112A9407137307	Ceiling (Hallway outside Restrooms		RG 7	
112A9407137308	Floor SE corner carpet flooring		RG8	
112A9407137309	Floor West Behind refrigerator		RG 8	
112A9407137310	Floor Mens Rest Room Entry		RG 8	
112A9407137311	Floor Womens Rest Room Entry		RG 8	
112A9407137312	Floor tile (in front of copier)			
112A9407137313	Floor tile - East Closet			

15. Sampled by/Date: [signature] 7/13/94

16. Checked by/Date (Check Back of Form):

RF-46722 (9/91) 222

EG&G Rocky Plant, Inc.

Golden, CO 02-0464

Safety and Hygiene Chain of Custody Record and Analysis Request

Name of Originator: W. D. Lockwood Title: Asbestos Coordinator Bldg/Ext: T441A/3484 Date: 7-13-94 Page 1 of 1

SAMPLE NUMBER Bldg/Y/M/D/P#/S#	ANALYZE FOR	VOLUME liters	SAMPLE TIME/	MEDIA	P A B	Personal Area Bulk	REMARKS	Lab Number
112A9407137301	Asbestos				B			
112A9407137302	Asbestos							
112A9407137303	Asbestos							
112A9407137304	Asbestos							
112A9407137305	Asbestos							
112A9407137306								
112A9407137307								
112A9407137308								
112A9407137309								
112A9407137310								
112A9407137311								
112A9407137312								
112A9407137313								

Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date
W. D. Lockwood	[illegible] Tuck	1520 7-13-94			
Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date
Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date
Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date

Report and Billing Instruction

Verbal To: N/A
Fax To: IM LINKUS
Report To: IM LINKUS
Bill To: EG+G
P.O.#/Release: 235860 1147A
Lab: ESC-Dell

Analysis Request

Industrial Hygiene Sample

☐ Standard Service ☐ Rush ☐ Other

Asbestos Samples

☒ Standard Service ☐ 24 Rush ☐ 2 Rush ☐ Other

Seal# (Release #) 147A-

Condition of Seal: ☐ Broken ☐ Unbroken

Signature:
Comments:

RF-47530 (Rev 9/91) 223

White - Return to Originator Yellow - Lab Copy Green - Sample Custodian Blue - Originator

Rocky Flats Plant Asbestos Containing Material
INSPECTION CHECKLIST
Appendix 1

1. Inspector W.D. Lockwood Signature [signature] Accreditation # [redacted] State CO
Date 7/13/94

2. BUILDING NO.: T112A
BLDG. AREA CODE: _____
- ■ 1. 1st Floor
- ☐ 2. 2nd Floor
- ☐ 3. 3rd Floor
- ☐ 4. 4th Floor
- ☐ 5. Basement
- ☐ 6. Crawl Space
- ☐ 7. Roof
- ☐ 8. Exterior of Bldg.
- ☐ 9. Plenum
- ☐ 10. Other

3. ROOM NUMBER: _____
COLUMN NUMBERS _____

4. SPECIFIC LOCATION NE Corner

5. % FUNCTIONAL SPACE 100%

6. FUNCTIONAL SPACE I.D. 22
HOMOGENEOUS AREA I.D. 04 - Floor Structure

7. MATERIAL TYPE CATEGORY:
- ☐ T. Thermal System Insulation
- ☐ S. Surfacing Material
- ● M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) _____

8.2 TSI ACM:
PIPE DIAMETER (IN.) _____

8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
_____

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
900 sq.ft.

8.6 SURFACING/MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
1/4 inch

9.1 FUNCTION CODE:
- ☐ 1. Acoustic Insulation
- ☐ 2. Baseboard
- ☐ 3. Boiler/Furnace Insulation
- ☐ 4. Caulking Matl
- ☐ 5. Ceiling Tile
- ☐ 6. Chilled Water Pipe
- ☐ 7. Chilled Water Pipe Fitting
- ☐ 8. Cold Water Pipe
- ☐ 9. Cold Water Pipe Fitting
- ☐ 10. Condensate Pipe
- ☐ 11. Condensate Pipe Fitting
- ☐ 12. Cooling Tower Baffles
- ☐ 13. Debris/Settled Dust
- ☐ 14. Domestic Cold Water Pipe
- ☐ 15. Domestic Cold Water Fitting
- ☐ 16. Door
- ☐ 17. Drain Pipe
- ☐ 18. Duct Insulation
- ☐ 19. Exterior Construction
- ● 20. Floor Tile
- ☐ 21. Fire Stop
- ☐ 22. Fireproofing Insulation
- ☐ 23. High Temp Water Pipe
- ☐ 24. High Temp Water Pipe Fitting
- ☐ 25. Mastic Adhesive
- ☐ 26. Roofing
- ☐ 27. Steam Pipe
- ☐ 28. Steam Pipe Fitting
- ☐ 29. Tank Insulation
- ☐ 30. Transite Board
- ☐ 31. Vibration Damper
- ☐ 32. Wall Board
- ☐ 33. Wall Insulation
- ☐ 34. Wall Plaster/Spackle
- ☐ 35. Other: _____

9.2 ASBESTOS FORM CODE:
- ☐ 1. Air cell
- ☐ 2. Blanket
- ☐ 3. Block
- ☐ 4. Cloth
- ☐ 5. Loose fill
- ☐ 6. Pre-formed
- ☐ 7. Sheet
- ☐ 8. Sprayed On
- ☐ 9. Troweled On
- ■ 10. Other: placed tile

9.3 COLOR CODE:
- ☐ B Blue
- ☐ BL Black
- ☐ BR Brown
- ☐ G Green
- ☐ GR Gray
- ☐ O Orange
- ■ W White
- ☐ Y Yellow
- ☐ OT Other: _____

10. CONSISTENCY:
- ■ Brittle - hard
- ☐ Semi - solid
- ☐ Fibrouse - loose
- ☐ Granular - pliable

11. CURRENTLY FRIABLE:
- ☐ Yes
- ■ No

12. CURRENT MATERIAL DAMAGE:
- ■ 1. No Visible Damage (U)
- ☐ 2. Damaged (D)
  < 10% Localized or
  < 25% Distributed
- ☐ 3. Significant Damage (S)
  10% or more Localized or
  25% or more Distributed

12.1 CAUSE OF DAMAGE:
- ☐ 1. Area Usage
- ☐ 2. Vibration
- ☐ 3. Air Flow
- ☐ 4. Water Damage
- ☐ 5. Service Activity
- ☐ 6. Usual Aging
- ☐ 7. Other: N/A

13. CONTAMINANT PRESENT:
- ● 0. None
- ☐ 1. Spotty
- ☐ 2. Widely Scattered
- ☐ 3. Entire Area

14. DISPERSAL FACTOR:
- ☐ 1. Water
- ☐ 2. Air
- ■ 3. Occupant
- ☐ 4. Machinery

15. AREA USED BY:
- ☐ Maintenance Workers
- ☐ Operations Workers
- ☒ Administrative Personnel
- ☐ Visiting Public

16. POTENTIAL FOR DAMAGE:
- ■ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL
FREQUENCY OF CONTACT/ACCESSIBILITY:
- ■ 0. Low/Seldom (< 1 time/month) (e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month) (e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month) (e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL
INFLUENCE OF VIBRATION:
- ■ 0. Low/None
- ☐ 1. Moderate/Noticeable (Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme (Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL
POTENTIAL FOR AIR EROSION:
- ■ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement (Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity (Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL
OVERALL POTENTIAL FOR DAMAGE:
- ■ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY: N/A
- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:
- ■ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ■ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
☐ 1 ☐ 2A ☐ 2B ■ 3

22. PLANNED ACTIVITY:
- ☐ New Activity/Use
- ☐ System Maintenance N/A
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:
- ☐ System Shutdown
- ☐ Backup System in Use N/A
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
- ■ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
- ■ ≥ 3, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

Sample #	%	Asbestos Type
9	1.8	Chrysotile

25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS _____

27. COMMENTS: Carpet cove1 tile

225

Rocky Flats Plant Asbestos Containing Material
INSPECTION CHECKLIST
Appendix 1

1. Inspector W.D. Lockwood Signature [signature] Accreditation # [redacted] State CO
   Date 7-23-99

2. BUILDING NO.: T112-A
   BLDG. AREA CODE: ____
   - [x] 1. 1st Floor
   - [ ] 2. 2nd Floor
   - [ ] 3. 3rd Floor
   - [ ] 4. 4th Floor
   - [ ] 5. Basement
   - [ ] 6. Crawl Space
   - [ ] 7. Roof
   - [ ] 8. Exterior of Bldg.
   - [ ] 9. Plenum
   - [ ] 10. Other

3. ROOM NUMBER: Closet
   COLUMN NUMBERS N/A

4. SPECIFIC LOCATION Closet NW Corner

5. % FUNCTIONAL SPACE 100%

6. FUNCTIONAL SPACE I.D. 04
   HOMOGENEOUS AREA I.D. 05

7. MATERIAL TYPE CATEGORY:
   - [ ] T. Thermal System Insulation
   - [ ] S. Surfacing Material
   - [x] M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) ____

8.2 TSI ACM:
PIPE DIAMETER (IN.) ____

8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
____

8.4 SURFACING MISC. ACM: 18 sq ft

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
____

8.6 SURFACING/MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
1/4

9.1 FUNCTION CODE:
- [ ] 1. Acoustic Insulation
- [ ] 2. Baseboard
- [ ] 3. Boiler/Furnace Insulation
- [ ] 4. Caulking Matl
- [ ] 5. Ceiling Tile
- [ ] 6. Chilled Water Pipe
- [ ] 7. Chilled Water Pipe Fitting
- [ ] 8. Cold Water Pipe
- [ ] 9. Cold Water Pipe Fitting
- [ ] 10. Condensate Pipe
- [ ] 11. Condensate Pipe Fitting
- [ ] 12. Cooling Tower Baffles
- [ ] 13. Debris/Settled Dust
- [ ] 14. Domestic Cold Water Pipe
- [ ] 15. Domestic Cold Water Fitting
- [ ] 16. Door
- [ ] 17. Drain Pipe
- [ ] 18. Duct Insulation
- [ ] 19. Exterior Construction
- [x] 20. Floor Tile
- [ ] 21. Fire Stop
- [ ] 22. Fireproofing Insulation
- [ ] 23. High Temp Water Pipe
- [ ] 24. High Temp Water Pipe Fitting
- [ ] 25. Mastic Adhesive
- [ ] 26. Roofing
- [ ] 27. Steam Pipe
- [ ] 28. Steam Pipe Fitting
- [ ] 29. Tank Insulation
- [ ] 30. Transite Board
- [ ] 31. Vibration Damper
- [ ] 32. Wall Board
- [ ] 33. Wall Insulation
- [ ] 34. Wall Plaster/Spackle
- [ ] 35. Other: ____

9.2 ASBESTOS FORM CODE:
- [ ] 1. Air cell
- [ ] 2. Blanket
- [ ] 3. Block
- [ ] 4. Cloth
- [ ] 5. Loose fill
- [x] 6. Pre-formed
- [ ] 7. Sheet
- [ ] 8. Sprayed On
- [ ] 9. Troweled On
- [ ] 10. Other: ____

9.3 COLOR CODE:
- [ ] B Blue
- [ ] BL Black
- [ ] BR Brown
- [ ] G Green
- [x] GR Gray
- [ ] O Orange
- [ ] W White
- [ ] Y Yellow
- [ ] OT Other: ____

10. CONSISTENCY:
- [x] Brittle - hard
- [ ] Semi - solid
- [ ] Fibrouse - loose
- [ ] Granular - pliable

11. CURRENTLY FRIABLE:
- [ ] Yes
- [x] No

12. CURRENT MATERIAL DAMAGE:
- [x] 1. No Visible Damage (U)
- [ ] 2. Damaged (D)
  < 10% Localized or
  < 25% Distributed
- [ ] 3. Significant Damage (S)
  10% or more Localized or
  25% or more Distributed

12.1 CAUSE OF DAMAGE:
- [ ] 1. Area Usage
- [ ] 2. Vibration
- [ ] 3. Air Flow
- [ ] 4. Water Damage
- [ ] 5. Service Activity
- [x] 6. Usual Aging
- [ ] 7. Other: ____

13. CONTAMINANT PRESENT:
- [x] 0. None
- [ ] 1. Spotty
- [ ] 2. Widely Scattered
- [ ] 3. Entire Area

14. DISPERSAL FACTOR:
- [ ] 1. Water
- [ ] 2. Air
- [x] 3. Occupant
- [ ] 4. Machinery

15. AREA USED BY:
- [x] Maintenance Workers
- [ ] Operations Workers
- [ ] Administrative Personnel
- [ ] Visiting Public

16. POTENTIAL FOR DAMAGE:
- ■ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL
FREQUENCY OF CONTACT/ACCESSIBILITY:
- ■ 0. Low/Seldom (< 1 time/month) (e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month) (e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month) (e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL
INFLUENCE OF VIBRATION:
- ■ 0. Low/None
- ☐ 1. Moderate/Noticeable (Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme (Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL
POTENTIAL FOR AIR EROSION:
- ■ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement (Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity (Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL
OVERALL POTENTIAL FOR DAMAGE:
- ■ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:
- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ■ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:
- ■ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ■ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ■ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
☐ 1 ☐ 2A ☐ 2B ■ 3

22. PLANNED ACTIVITY:
- ☐ New Activity/Use
- ■ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED: N/A
- ☐ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
- ■ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
- ■ ≥ 3, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

Sample #	%	Asbestos Type
013	2.7	chrysotile

25.2 LAB REPORT _____

28. WORK PACKAGE NUMBERS
N/A

27. COMMENTS: Floor tiles are in good shape. Just need to know when its going to be ripped out

Rocky Flats Plant Asbestos Containing Material
INSPECTION CHECKLIST
Appendix 1

1. Inspector W.D. Lockwood Signature [signature] Accreditation # [redacted] State CO
   Date 7.13.94

2. BUILDING NO.: 112A
   BLDG. AREA CODE: _____
   - ● 1. 1st Floor
   - ☐ 2. 2nd Floor
   - ☐ 3. 3rd Floor
   - ☐ 4. 4th Floor
   - ☐ 5. Basement
   - ☐ 6. Crawl Space
   - ☐ 7. Roof
   - ☐ 8. Exterior of Bldg.
   - ☐ 9. Plenum
   - ☐ 10. Other

3. ROOM NUMBER: Restrooms
   COLUMN NUMBERS N/A

4. SPECIFIC LOCATION East Bldg. Center

5. % FUNCTIONAL SPACE _____

6. FUNCTIONAL SPACE I.D. 100%
   HOMOGENEOUS AREA I.D. 05

7. MATERIAL TYPE CATEGORY:
   - ☐ T. Thermal System Insulation
   - ☐ S. Surfacing Material
   - ■ M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) _____

8.2 TSI ACM:
PIPE DIAMETER (IN.) _____

8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
_____

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
30 sq ft.

8.6 SURFACING/MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
1/4 inch

9.1 FUNCTION CODE:
- ☐ 1. Acoustic Insulation
- ☐ 2. Baseboard
- ☐ 3. Boiler/Furnace Insulation
- ☐ 4. Caulking Matl
- ☐ 5. Ceiling Tile
- ☐ 6. Chilled Water Pipe
- ☐ 7. Chilled Water Pipe Fitting
- ☐ 8. Cold Water Pipe
- ☐ 9. Cold Water Pipe Fitting
- ☐ 10. Condensate Pipe
- ☐ 11. Condensate Pipe Fitting
- ☐ 12. Cooling Tower Baffles
- ☐ 13. Debris/Settled Dust
- ☐ 14. Domestic Cold Water Pipe
- ☐ 15. Domestic Cold Water Fitting
- ☐ 16. Door
- ☐ 17. Drain Pipe
- ☐ 18. Duct Insulation
- ☐ 19. Exterior Construction
- ☐ 20. Floor Tile
- ☐ 21. Fire Stop
- ☐ 22. Fireproofing Insulation
- ☐ 23. High Temp Water Pipe
- ☐ 24. High Temp Water Pipe Fitting
- ■ 25. Mastic Adhesive
- ☐ 26. Roofing
- ☐ 27. Steam Pipe
- ☐ 28. Steam Pipe Fitting
- ☐ 29. Tank Insulation
- ☐ 30. Transite Board
- ☐ 31. Vibration Damper
- ☐ 32. Wall Board
- ☐ 33. Wall Insulation
- ☐ 34. Wall Plaster/Spackle
- ☐ 35. Other: _____

9.2 ASBESTOS FORM CODE:
- ☐ 1. Air cell
- ☐ 2. Blanket
- ☐ 3. Block
- ☐ 4. Cloth
- ☐ 5. Loose fill
- ☐ 6. Pre-formed
- ☐ 7. Sheet
- ☐ 8. Sprayed On
- ■ 9. Troweled On
- ☐ 10. Other: _____

9.3 COLOR CODE:
- ■ B Blue
- ☐ BL Black
- ☐ BR Brown
- ☐ G Green
- ☐ GR Gray
- ☐ O Orange
- ☐ W White
- ☐ Y Yellow
- ☐ OT Other: _____

10. CONSISTENCY:
- ■ Brittle - hard
- ☐ Semi - solid
- ☐ Fibrouse - loose
- ☐ Granular - pliable

11. CURRENTLY FRIABLE:
- ☐ Yes
- ■ No

12. CURRENT MATERIAL DAMAGE:
- ■ 1. No Visible Damage (U)
- ☐ 2. Damaged (D)
  < 10% Localized or
  < 25% Distributed
- ☐ 3. Significant Damage (S)
  10% or more Localized or
  25% or more Distributed

12.1 CAUSE OF DAMAGE:
- ☐ 1. Area Usage
- ☐ 2. Vibration
- ☐ 3. Air Flow
- ☐ 4. Water Damage
- ☐ 5. Service Activity
- ☐ 6. Usual Aging
- ☐ 7. Other: _____

13. CONTAMINANT PRESENT:
- ■ 0. None
- ☐ 1. Spotty
- ☐ 2. Widely Scattered
- ☐ 3. Entire Area

14. DISPERSAL FACTOR:
- ☐ 1. Water
- ☐ 2. Air
- ■ 3. Occupant
- ☐ 4. Machinery

15. AREA USED BY:
- ☐ Maintenance Workers
- ☐ Operations Workers
- ■ Administrative Personnel
- ☐ Visiting Public

16. POTENTIAL FOR DAMAGE:
- ● Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL
FREQUENCY OF CONTACT/ACCESSIBILITY:
- ● 0. Low/Seldom (< 1 time/month) (e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month) (e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month) (e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL
INFLUENCE OF VIBRATION:
- ● 0. Low/None
- ☐ 1. Moderate/Noticeable (Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme (Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL
POTENTIAL FOR AIR EROSION:
- ● 0. Low/None
- ☐ 1. Moderate or Noticeable Movement (Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity (Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL
OVERALL POTENTIAL FOR DAMAGE:
- ● 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY: N/A
- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:
- ● 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
- ● 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
☐ 1 ☐ 2A ☐ 2B ● 3

22. PLANNED ACTIVITY: N/A
- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED: N/A
- ☐ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
- ■ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
- ■ ≥ 8, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

Sample #	%	Asbestos Type
10	1.8	Chrysotile
11	.9	Chrysotile

25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS

27. COMMENTS: In Restroom need to be notified if Linoleum is removed.

Rocky Flats Plant Asbestos Containing Material
INSPECTION CHECKLIST
Appendix 1

Inspector W.D. Lockwood Signature [signature] Accreditation # [redacted] State CO
Date 4/5/94

2. BUILDING NO.: T-112-A
BLDG. AREA CODE: 1
- ■ 1. 1st Floor
- ☐ 2. 2nd Floor
- ☐ 3. 3rd Floor
- ☐ 4. 4th Floor
- ☐ 5. Basement
- ☐ 6. Crawl Space
- ☐ 7. Roof
- ☐ 8. Exterior of Bldg.
- ☐ 9. Plenum
- ☐ 10. Other

3. ROOM NUMBER: Company Store
COLUMN NUMBERS N/A

4. SPECIFIC LOCATION Company Store

5. % FUNCTIONAL SPACE 0

6. FUNCTIONAL SPACE I.D. T-112-A-F-02
HOMOGENEOUS AREA I.D. T-112A-H-02

7. MATERIAL TYPE CATEGORY:
- ☒ T. Thermal System Insulation
- ☐ S. Surfacing Material
- ☒ M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) N/A

8.2 TSI ACM:
PIPE DIAMETER (IN.) N/A
TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
N/A

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
1800

8.6 SURFACING/MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
3/4"

9.1 FUNCTION CODE:
- ☐ 1. Acoustic Insulation
- ☐ 2. Baseboard
- ☐ 3. Boiler/Furnace Insulation
- ☐ 4. Caulking Mat'l
- ☐ 5. Ceiling Tile
- ☐ 6. Chilled Water Pipe
- ☐ 7. Chilled Water Pipe Fitting
- ☐ 8. Cold Water Pipe
- ☐ 9. Cold Water Pipe Fitting
- ☐ 10. Condensate Pipe
- ☐ 11. Condensate Pipe Fitting
- ☐ 12. Cooling Tower Baffles
- ☐ 13. Debris/Settled Dust
- ☐ 14. Domestic Cold Water Pipe
- ☐ 15. Domestic Cold Water Fitting
- ☐ 16. Door
- ☐ 17. Drain Pipe
- ☐ 18. Duct Insulation
- ☐ 19. Exterior Construction
- ☐ 20. Floor Tile
- ☐ 21. Fire Stop
- ☐ 22. Fireproofing Insulation
- ☐ 23. High Temp Water Pipe
- ☐ 24. High Temp Water Pipe Fitting
- ☐ 25. Mastic Adhesive
- ☐ 26. Roofing
- ☐ 27. Steam Pipe
- ☐ 28. Steam Pipe Fitting
- ☐ 29. Tank Insulation
- ☐ 30. Transite Board
- ☐ 31. Vibration Damper
- ☒ 32. Wall Board
- ☐ 33. Wall Insulation
- ☐ 34. Wall Plaster/Spackle
- ☐ 35. Other: Wood Panel

9.2 ASBESTOS FORM CODE:
- ☐ 1. Air cell
- ☐ 2. Blanket
- ☐ 3. Block
- ☐ 4. Cloth
- ☐ 5. Loose fill
- ☐ 6. Pre-formed
- ☐ 7. Sheet
- ☐ 8. Sprayed On
- ☐ 9. Troweled On
- ☐ 10. Other: non asb.

9.3 COLOR CODE:
- ☐ B Blue
- ☐ BL Black
- ☐ BR Brown
- ☐ G Green
- ☐ GR Gray
- ☐ O Orange
- ☐ W White
- ☐ Y Yellow
- ☐ OT Other: N/A

10. CONSISTENCY:
- ☐ Brittle - hard
- ☐ Semi - solid
- ☐ Fibrouse - loose
- ☐ Granular - pliable N/A

11. CURRENTLY FRIABLE:
- ☐ Yes
- ■ No

12. CURRENT MATERIAL DAMAGE:
- ■ 1. No Visible Damage (U)
- ☐ 2. Damaged (D)
  < 10% Localized or
  < 25% Distributed
- ☐ 3. Significant Damage (S)
  10% or more Localized or
  25% or more Distributed

12.1 CAUSE OF DAMAGE:
- ☐ 1. Area Usage
- ☐ 2. Vibration
- ☐ 3. Air Flow
- ☐ 4. Water Damage
- ☐ 5. Service Activity
- ☐ 6. Usual Aging
- ☐ 7. Other: N/A

13. CONTAMINANT PRESENT:
- ■ 0. None
- ☐ 1. Spotty
- ☐ 2. Widely Scattered
- ☐ 3. Entire Area

14. DISPERSAL FACTOR:
N/A
- ☐ 1. Water
- ☐ 2. Air
- ☐ 3. Occupant
- ☐ 4. Machinery

15. AREA USED BY:
- ☐ Maintenance Workers
- ☐ Operations Workers
- ● Administrative Personnel
- ☐ Visiting Public

OTENTIAL FOR DAMAGE:
) Low Potential for damage (L)
) Potential for damage (M)
) ial for significant damage (H)

) 3ANCE POTENTIAL
REQUENCY OF CONTACT/ACCESSIBILITY:
) 0. Low/Seldom (< 1 time/month)
(e.g., Area Rarely Used)
) 1. Moderate/Occasional (1-4 times/month)
(e.g., Rooms/Offices)
) 2. High/Frequently (>4 times/month)
(e.g., Hallways/Corridors)

)ISTURBANCE POTENTIAL
NFLUENCE OF VIBRATION:
) 0. Low/None
) 1. Moderate/Noticeable
(Motors, loud sounds, vibrating ducts w/o fan, etc.)
) 2. High/Extreme
(Easily sensed vibration, vibrating duct w/fan, etc.)

)ISTURBANCE POTENTIAL
OTENTIAL FOR AIR EROSION:
) 0. Low/None
) 1. Moderate or Noticeable Movement
(Air shaft, Air stream, vent, etc.)
) 2. High/Extreme velocity
(Air Plenum, Elevator Shaft, Fan Room, etc.)

)IST RBANCE POTENTIAL
POTENTIAL FOR DAMAGE:
v Potential for Damage
.ential for Damage
) 2. otential for Significant Damage

HYSICAL ASSESSMENT CATEGORY:
) 1. Damaged or Significantly Damaged TSI ACM
) 2. Damaged Friable Surfacing ACM
) 3. Significantly Damaged Friable Surfacing ACM
) 4. Damaged or Significantly Damaged Misc. ACM
) 5. ACBM with Potential for Damage
) 6. ACBM with Potential for Significant Damage
) 7. Any remaining Friable ACBM or Friable suspect ACBM

AZARD POTENTIAL CLASSIFICATION:
) 1. ACBM in good condition w/low potential for disturbance
) 2. ACBM in good condition w/potential for damage
) 3. ACBM in good condition w/potential for significant damage
) 4. ACBM in Damaged condition w/low potential for disturbance
) 5. ACBM in Damaged condition w/potential for damage
) 6. ACBM in Damaged condition w/potential for significant damage
) 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
N/A
- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
N/A ☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:
N/A
- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:
N/A
- ☐ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
N/A
- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
N/A
- ☐ ≥ 3, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

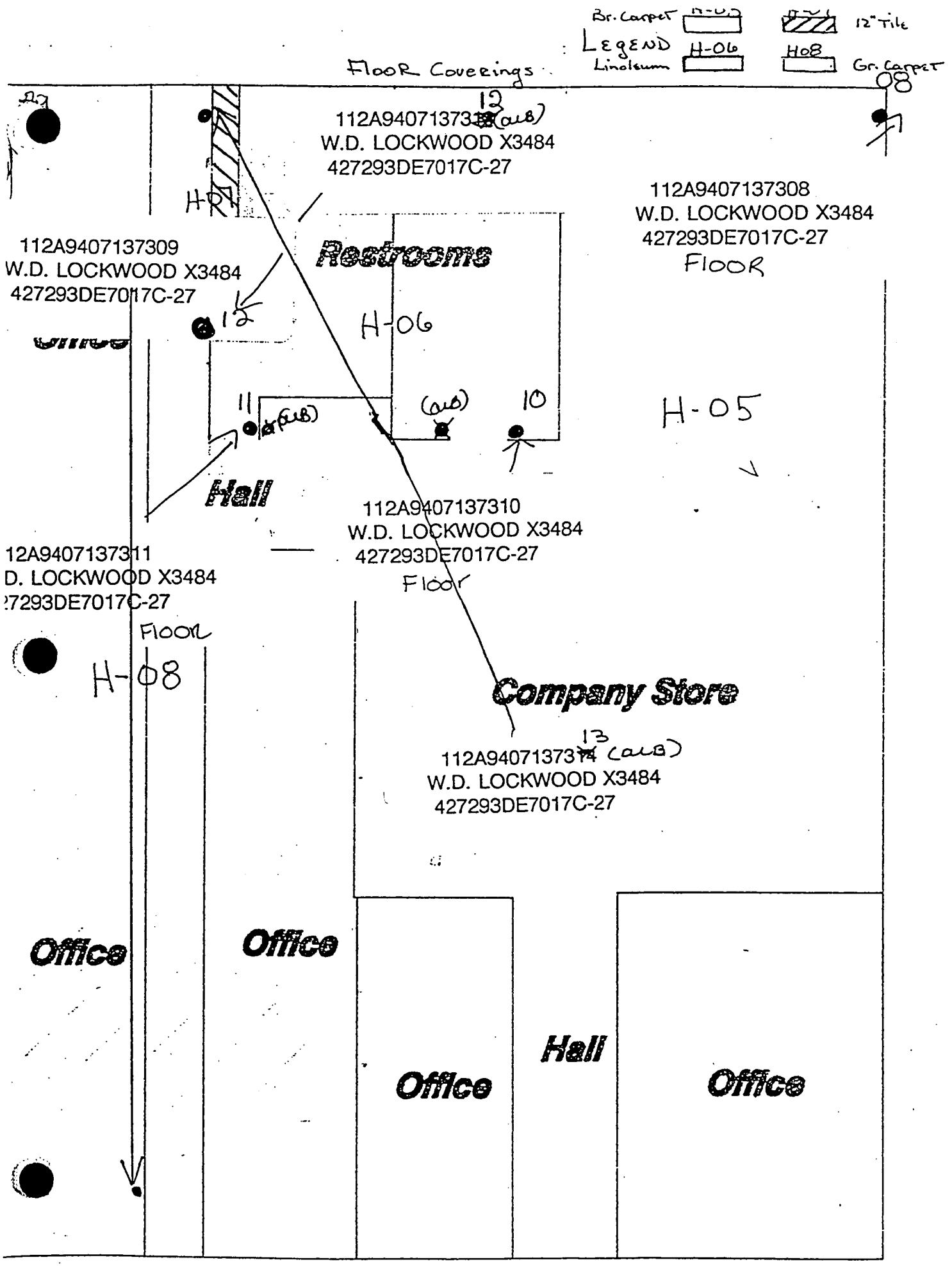
25.1 N/A

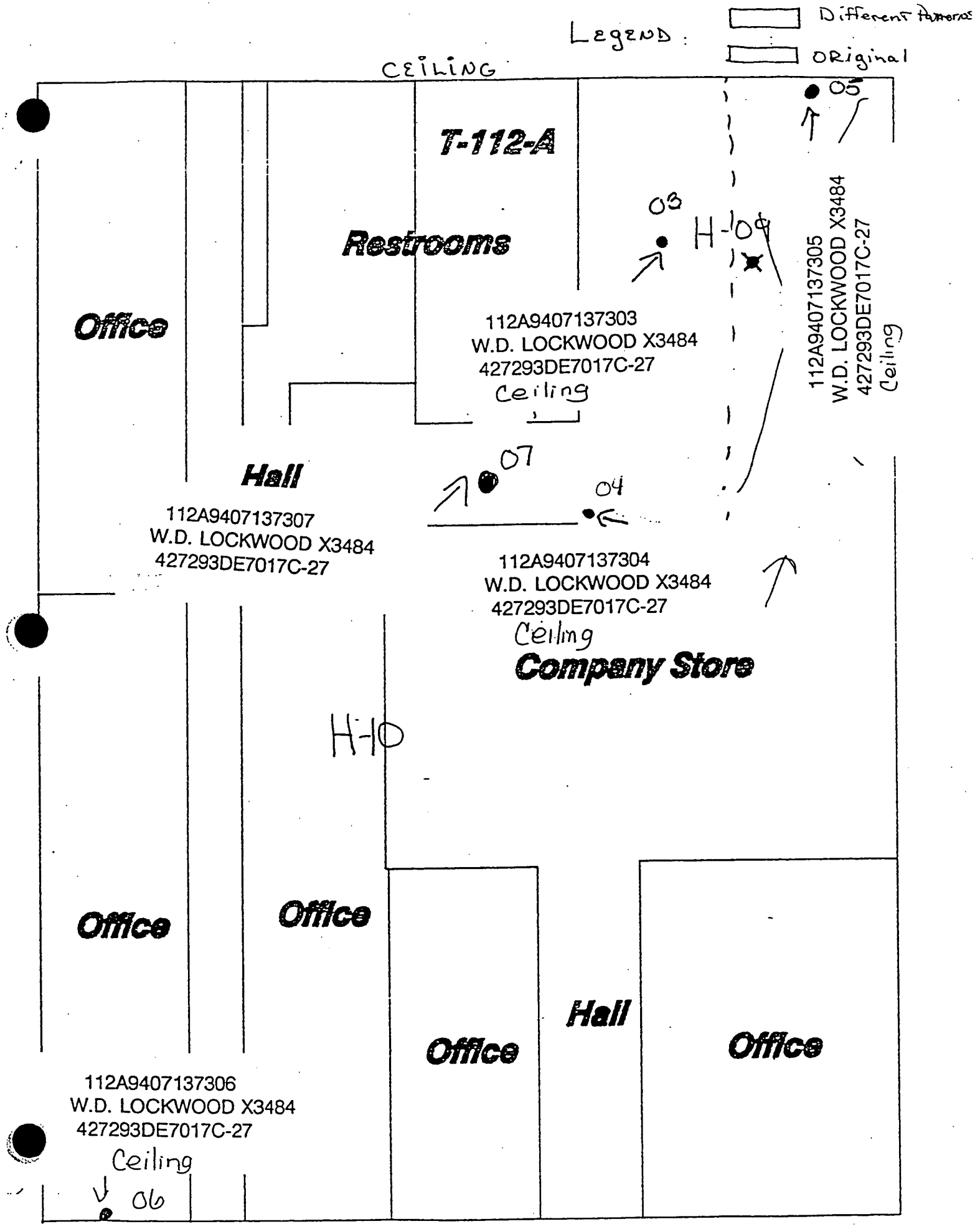
Sample #	%	Asbestos Type

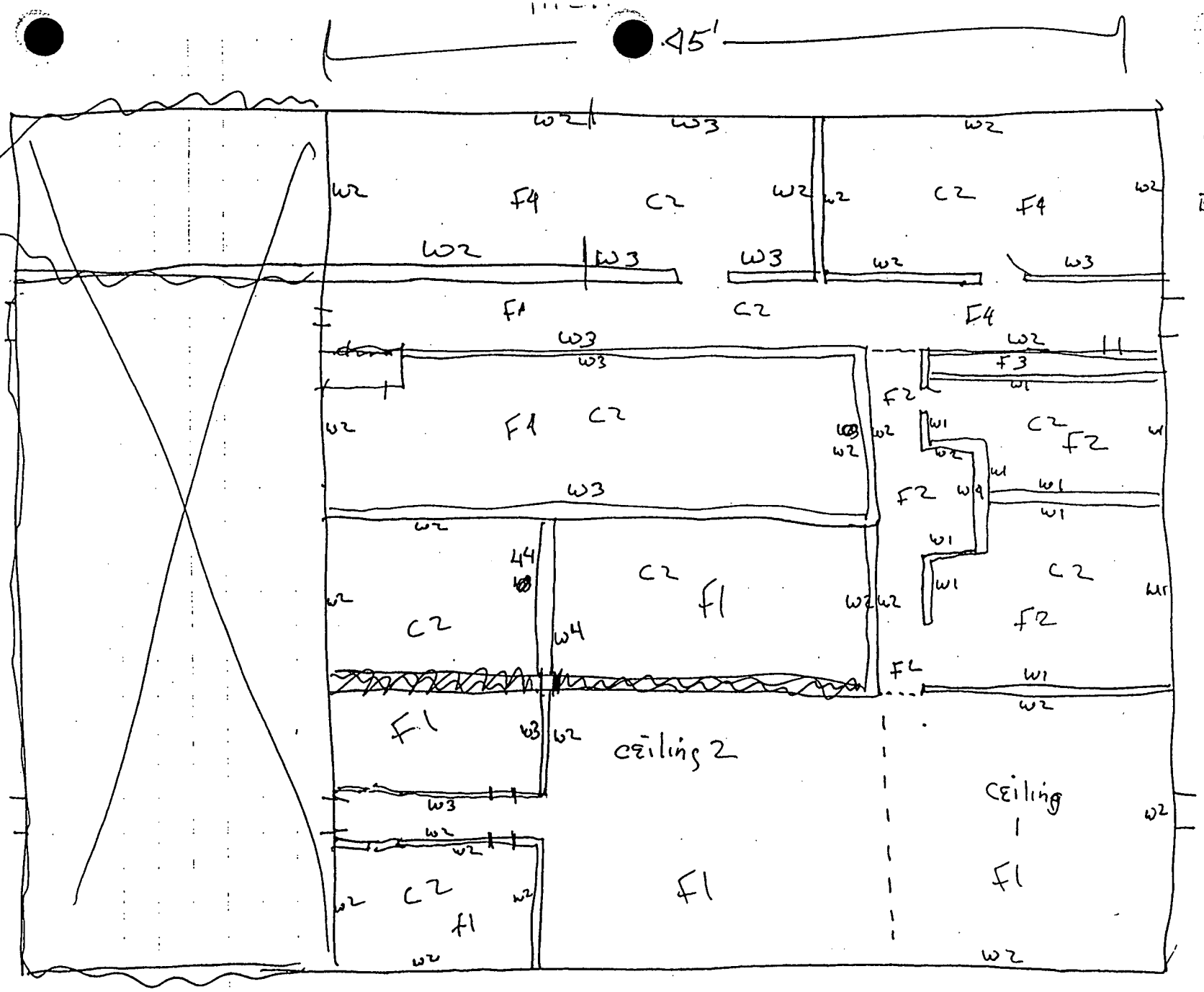
25.2 LAB REPORT N/A

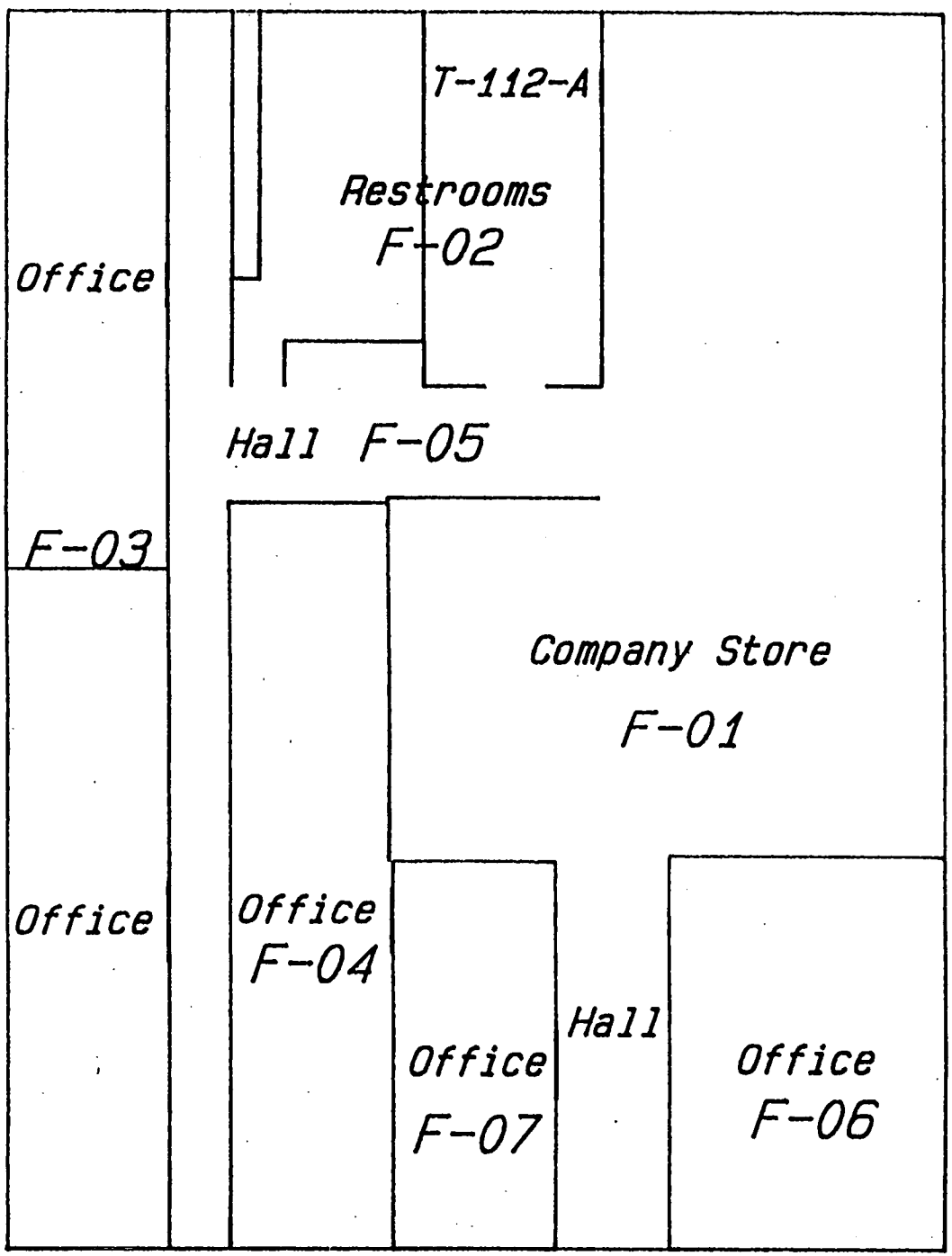
26. WORK PACKAGE NUMBERS
N/A

27. COMMENTS: Wood Paneling Through out the Bldg


Br. Carpet H-02
12" Tile
LEGEND
Linoleum H-06
H08
Gr. Carpet
Floor Coverings
08
12
112A9407137308 (alb)
W.D. LOCKWOOD X3484
427293DE7017C-27
112A9407137308
W.D. LOCKWOOD X3484
427293DE7017C-27
FLOOR
112A9407137309
W.D. LOCKWOOD X3484
427293DE7017C-27
Restrooms
H-06
12
11
(alb)
(alb)
10
H-05
Hall
112A9407137310
W.D. LOCKWOOD X3484
427293DE7017C-27
FLOOR
12A9407137311
D. LOCKWOOD X3484
:7293DE7017C-27
FLOOR
H-08
Company Store
13
112A9407137314 (alb)
W.D. LOCKWOOD X3484
427293DE7017C-27
Office
Office
Office
Hall
Office


Legend:
Different Panorama
Original
CEILING
T-112-A
Restrooms
Office
Hall
Office
Office
Office
Hall
Office
Company Store
03
04
05
06
07
H-10
H-10
112A9407137303
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling
112A9407137305
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling
112A9407137307
W.D. LOCKWOOD X3484
427293DE7017C-27
112A9407137304
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling
112A9407137306
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling


45'
60'
ceiling 1
ceiling 2
Walls 1
Bath Panel
Walls 2
Light Panel
Walls 3
Dark panel
wall 4
plaster
Floor 1
carpet Brown
Floor 2
Linoleum
Floor 3
Floor 4
carpet Grey
Floor 5
W1
W2
W3
W4
F1
F2
F3
F4
C2
ceiling 2
ceiling 1


T-112-A
Restrooms
F-02
Office
Hall F-05
F-03
Company Store
F-01
Office
Office
F-04
Hall
Office
F-07
Office
F-06

Appendix 8

Historical Inspection Report for T112C

NVLAP LAB NO. 1896

ASBESTOS - TEM, PCM, PLM, SEM
METALS - AA, FLAME/FURNACE
AIRBORNE PARTICULATES
SPECIAL PARTICLE ANALYSIS

NVLAP LAB I.D. 10768

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

1827 GRANT STREET DENVER, COLORADO 80203 (800) 678-7374 (303) 830-1986 FAX (303) 863-9196

July 19, 1994

Ms. Julie Linkus
EG&G Rocky Flats Plant
PO Box 464
Golden, CO 80402-0464

RE: Job No. RES 20769 - 23586JL/148A - Bulk Samples: 112C9407137301, 112C9407137302, 112C9407137303, 112C9407137304, 112C9407137305, 112C9407137306, 112C9407137307, 112C9407137308 and 112C9407137309.

Dear Ms. Linkus:

Reservoirs Environmental Services, Inc. (RES, Inc.) has analyzed nine bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on July 14, 1994, and initial results were telephoned to your office on July 18, 1994. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763, Subpart F, Appendix A). The Analytical Results are presented in Table I.

RES, Inc. has assigned job number RES 20769 to this study. This report is considered highly confidential and the sole property of EG&G Rocky Flats Plant. RES, Inc. will not discuss any part of this study with personnel other than those of the client company. Samples will be disposed of after sixty days unless longer storage is requested. The US EPA guideline (40 CFR Part 763, Subpart F, Appendix A) was developed for use on friable building materials and is not recommended for non-friable materials such as floor tiles. RES, Inc. recommends additional analyses to confirm negative PLM results on floor tiles.

If you should have any questions about this report, please feel free to call me at 830-1986.

Sincerely,

Robert K. Dickson
Assistant Division Manager

RKD/cma

Analyst(s):
Cheryl A. Dempsey
Greg Behnfeldt
Patrick Coughlan
Paul D. Lo Scalzo
Robert L. Gault

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20769
Client: EG&G Rocky Flats Plant
Client Project: 23586JL/148A
Date Samples Received: July 14, 1994
Analysis Type: PLM Short Report
Turnaround: 3-5 Day

Client Sample Number	Lab ID Number	TOTAL ASBESTOS (%)	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
112C9407137301	EM 128544	ND	A	White paint	2		ND	1	1	0	0	0	0	0	98
			B	Tan fibrous perlitic material w/tan resinous material	98		ND	30	35	0	0	0	0	0	35
112C9407137302	EM 128545	ND	A	White paint	1		ND	1	2	0	0	0	0	0	97
			B	Tan fibrous perlitic material	99		ND	25	40	0	0	0	0	0	35
112C9407137303	EM 128546	ND	A	Tan fibrous perlitic material w/tan resinous material	100		ND	30	35	0	0	0	0	0	35
112C9407137304	EM 128547	ND	A	White-gray resinous paint	2		ND	5	0	0	0	0	0	0	95
			B	Tan fibrous material	15		ND	90	0	0	0	0	0	0	10
			C	White fibrous plaster	83		ND	2	8	0	0	0	TR	0	90
112C9407137305	EM 128548	ND	A	White-gray resinous paint	2		ND	5	0	0	0	0	0	0	95
			B	Tan fibrous material	15		ND	90	0	0	0	0	0	0	10
			C	White fibrous plaster	83		ND	2	8	0	0	0	0	0	90
112C9407137306	EM 128549	ND	A	White-gray resinous paint	2		ND	5	0	0	0	0	0	0	95
			B	Tan fibrous material	15		ND	90	0	0	0	0	0	0	10
			C	White fibrous plaster	83		ND	2	8	0	0	0	0	0	90

ND = None Detected
TR = Trace
CELL = Cellulose
Mat = Material
ORG = Organic
BRUC = Brucite
WOLL = Wollastonite
Trem-Act = Tremolite-Actinolite
GYP = Gypsum
SYNTH = Synthetic

Analyst: LW/CD

Data QA

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 20769
Client: EG&G Rocky Flats Plant
Client Project: 23586JL/148A
Date Samples Received: July 14, 1994
Analysis Type: PLM Short Report
Turnaround: 3-5 Day

Client Sample Number	Lab ID Number	TOTAL ASBESTOS (%)	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	ASBESTOS CONTENT BY LAYER Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
112C9407137307	EM 128550	ND	A	Tan & white resin	10		ND	2	0	0	0	0	0	0	98
			B	Multicolored fibrous material	90		ND	2	0	93	0	0	0	0	5
112C9407137308	EM 128551	ND	A	White resin w/white plaster	15		ND	5	0	TR	0	0	0	0	95
			B	Multicolored fibrous material	85		ND	0	0	90	0	0	0	0	10
112C9407137309	EM 128552	ND	A	Whtie resin w/white plaster	20		ND	5	3	2	0	0	0	0	90
			B	Multicolored fibrous material	80		ND	0	0	90	0	0	0	0	10

ND = None Detected
TR = Trace
CELL = Cellulose
Mat = Material
ORG = Organic
BRUC = Brucite
WOLL = Wollastonite
Trem-Act = Tremolite-Actinolite
GYP = Gypsum
SYNTH = Synthetic

Data QA

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1. Sample # (Bldg-Y-M-D-P#-S#)

1 12C94 07 13 73 01 ☐ SINGLE

through

1 12C94 07 13 73 09 ☒ MULTIPLE

ROCKY FLATS PLANT
INDUSTRIAL HYGIENE BULK SAMPLE FORM

2. Process Title:

3. Subprocess Title:

4. Building/OU Etc.: T-112-C

5. Chain of Custody Seal #:

6. Analytical Sample Method: PLM

7. Lab Report #:

8. Lab Method:

9. Related Forms:

10. Sample # (Bldg-Y-M-D-P#-S#)	11. Location Information	12. Material Type	13. Bulk Sample Description	14. Results
112C94071373 01	Ceiling, Comm Rm, SE corn	misc	Random Sampling Grid 1	
112C94071373 02	Ceiling, Middle Office NE corner		Random Sampling Grid 1	
112C94071373 03	Ceiling Hallway NW (near Exit)		Random Sampling Grid 1	
112C94071373 04	Wall - NE Tele Comm room		Random Sampling Grid 2	
112C94071373 05	Wall Bottom Left corner - Doorway		Random Sampling Grid 2	
112C94071373 06	Wall Bottom Left Corner - Doorway		Random Sampling Grid 2	
112C94071373 07	Floor - SW Corner		Random Sampling Grid 3	
112C94071373 08	Floor -		Random Sampling Grid 3	
112C94071373 09	Floor			

15. Sampled by/Date: Wayne Sandwood 7-13-94

16. Checked by/Date (Check Back of Form):

RF-46722 (9/91)

EG&G Roc[illegible]ats Plant, Inc.

Golden, CO 80402-0464

Safety and Hygiene Chain of Custody Record and Analysis Request

Name of Originator: [illegible] Title: [illegible] Bldg/Ext: [illegible] Date: [illegible] Page 1 of 1

SAMPLE NUMBER Bldg/Y/M/D/P#/S#	ANALYZE FOR	VOLUME liters	SAMPLE TIME/	MEDIA	P A B	Personal Area Bulk	REMARKS	Lab Number
[illegible]								
[illegible]								
[illegible]	↓				↓			
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]								
[illegible]	✓				✓			

Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date
[illegible]	[illegible]	1500 7-13-94			
Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date
Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date
Relinquished by	Received by	Time/Date	Relinquished by	Received by	Time/Date

Report and Billing Instruction

Verbal To: [illegible]

Fax To: [illegible]

Report To: [illegible]

Bill To: [illegible]

P.O.#/Release: [illegible]

Lab: [illegible]

Analysis Request

Industrial Hygiene Sample

☐ Standard Service ☐ Rush ☐ Other _____

Asbestos Samples

☑ Standard Service ☐ 24 Rush ☐ 2 Rush ☐ Other _____

Seal# (Release #) 4584

Condition of Seal: ☐ Broken ☐ Unbroken

Signature: _____

Comments: _____

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Rocky Flats Plant Asbestos Containing Material

INSPECTION CHECKLIST

Appendix 1

No Asbestos Found

1. Inspector W.D. Lockwood Signature W.D. Lockwood Accreditation [redacted]
Date 7/13/94

2. BUILDING NO.: T112C
BLDG. AREA CODE: _____
- ■ 1. 1st Floor
- ☐ 2. 2nd Floor
- ☐ 3. 3rd Floor
- ☐ 4. 4th Floor
- ☐ 5. Basement
- ☐ 6. Crawl Space
- ☐ 7. Roof
- ☐ 8. Exterior of Bldg.
- ☐ 9. Plenum
- ☐ 10. Other

3. ROOM NUMBER: _____
COLUMN NUMBERS _____

4. SPECIFIC LOCATION _____

5. % FUNCTIONAL SPACE _____

6. FUNCTIONAL SPACE I.D. _____
HOMOGENEOUS AREA I.D. _____

7. MATERIAL TYPE CATEGORY:
- ☐ T. Thermal System Insulation
- ☐ S. Surfacing Material
- ☐ M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) _____

8.2 TSI ACM:
PIPE DIAMETER (IN.) _____

8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
_____

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
_____

8.6 SURFACING/MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
_____

9.1 FUNCTION CODE:
- ☐ 1. Acoustic Insulation
- ☐ 2. Baseboard
- ☐ 3. Boiler/Furnace Insulation
- ☐ 4. Caulking Matl
- ☐ 5. Ceiling Tile
- ☐ 6. Chilled Water Pipe
- ☐ 7. Chilled Water Pipe Fitting
- ☐ 8. Cold Water Pipe
- ☐ 9. Cold Water Pipe Fitting
- ☐ 10. Condensate Pipe
- ☐ 11. Condensate Pipe Fitting
- ☐ 12. Cooling Tower Baffles
- ☐ 13. Debris/Settled Dust
- ☐ 14. Domestic Cold Water Pipe
- ☐ 15. Domestic Cold Water Fitting
- ☐ 16. Door
- ☐ 17. Drain Pipe
- ☐ 18. Duct Insulation
- ☐ 19. Exterior Construction
- ☐ 20. Floor Tile
- ☐ 21. Fire Stop
- ☐ 22. Fireproofing Insulation
- ☐ 23. High Temp Water Pipe
- ☐ 24. High Temp Water Pipe Fitting
- ☐ 25. Mastic Adhesive
- ☐ 26. Roofing
- ☐ 27. Steam Pipe
- ☐ 28. Steam Pipe Fitting
- ☐ 29. Tank Insulation
- ☐ 30. Transite Board
- ☐ 31. Vibration Damper
- ☐ 32. Wall Board
- ☐ 33. Wall Insulation
- ☐ 34. Wall Plaster/Spackle
- ☐ 35. Other: _____

9.2 ASBESTOS FORM CODE:
- ☐ 1. Air cell
- ☐ 2. Blanket
- ☐ 3. Block
- ☐ 4. Cloth
- ☐ 5. Loose fill
- ☐ 6. Pre-formed
- ☐ 7. Sheet
- ☐ 8. Sprayed On
- ☐ 9. Troweled On
- ☐ 10. Other: _____

9.3 COLOR CODE:
- ☐ B Blue
- ☐ BL Black
- ☐ BR Brown
- ☐ G Green
- ☐ GR Gray
- ☐ O Orange
- ☐ W White
- ☐ Y Yellow
- ☐ OT Other: _____

10. CONSISTENCY:
- ☐ Brittle - hard
- ☐ Semi - solid
- ☐ Fibrouse - loose
- ☐ Granular - pliable

11. CURRENTLY FRIABLE:
- ☐ Yes
- ☐ No

12. CURRENT MATERIAL DAMAGE:
- ☐ 1. No Visible Damage (U)
- ☐ 2. Damaged (D)
  < 10% Localized or
  < 25% Distributed
- ☐ 3. Significant Damage (S)
  10% or more Localized or
  25% or more Distributed

12.1 CAUSE OF DAMAGE:
- ☐ 1. Area Usage
- ☐ 2. Vibration
- ☐ 3. Air Flow
- ☐ 4. Water Damage
- ☐ 5. Service Activity
- ☐ 6. Usual Aging
- ☐ 7. Other: _____

13. CONTAMINANT PRESENT:
- ☐ 0. None
- ☐ 1. Spotty
- ☐ 2. Widely Scattered
- ☐ 3. Entire Area

14. DISPERSAL FACTOR:
- ☐ 1. Water
- ☐ 2. Air
- ☐ 3. Occupant
- ☐ 4. Machinery

15. AREA USED BY:
- ☐ Maintenance Workers
- ☐ Operations Workers
- ☐ Administrative Personnel
- ☐ Visiting Public

16. POTENTIAL FOR DAMAGE:
- ☐ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL
FREQUENCY OF CONTACT/ACCESSIBILITY:
- ☐ 0. Low/Seldom (< 1 time/month) (e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month) (e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month) (e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL
INFLUENCE OF VIBRATION:
- ☐ 0. Low/None
- ☐ 1. Moderate/Noticeable (Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme (Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL
POTENTIAL FOR AIR EROSION:
- ☐ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement (Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity (Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL
OVERALL POTENTIAL FOR DAMAGE:
- ☐ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:
- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:
- ☐ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:
- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:
- ☐ System Shutdown
- ☐ Backup System In Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
- ☐ ≥ 3, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

Sample #	%	Asbestos Type

25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS
_____

27. COMMENTS: _____
_____
_____
_____
_____

1. Inspector W.D. Lockood Signature [signature] Accreditation # [redacted] State CO
Date _____

2. BUILDING NO.: T112C
BLDG. AREA CODE: ____

X	1. 1st Floor	☐	6. Crawl Space
☐	2. 2nd Floor	☐	7. Roof
☐	3. 3rd Floor	☐	8. Exterior of Bldg.
☐	4. 4th Floor	☐	9. Plenum
☐	5. Basement	☐	10. Other

3. ROOM NUMBER: Comm. Room SE Corner
COLUMN NUMBERS N/A

4. SPECIFIC LOCATION SE Corner

5. % FUNCTIONAL SPACE 100%

6. FUNCTIONAL SPACE I.D. 04
HOMOGENEOUS AREA I.D. _____

7. MATERIAL TYPE CATEGORY:
☐ T. Thermal System Insulation
☐ S. Surfacing Material
☒ M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) NA

8.2 TSI ACM:
PIPE DIAMETER (IN.) NA

8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
NA

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
~~Total~~ 6860 sqft

8.6 SURFACING MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
1/4"

9.1 FUNCTION CODE:

☐	1. Acoustic Insulation	☐	19. Exterior Construction
☐	2. Baseboard	☐	20. Floor Tile
☐	3. Boiler/Furnace Insulation	☐	21. Fire Stop
☐	4. Caulking Matl	☐	22. Fireproofing Insulation
☐	5. Ceiling Tile	☐	23. High Temp Water Pipe
☐	6. Chilled Water Pipe	☐	24. High Temp Water Pipe Fitting
☐	7. Chilled Water Pipe Fitting	☐	25. Mastic Adhesive
☐	8. Cold Water Pipe	☐	26. Roofing
☐	9. Cold Water Pipe Fitting	☐	27. Steam Pipe
☐	10. Condensate Pipe	☐	28. Steam Pipe Fitting
☐	11. Condensate Pipe Fitting	☐	29. Tank Insulation
☐	12. Cooling Tower Baffles	☐	30. Transite Board
☐	13. Debris/Settled Dust	☐	31. Vibration Damper
☐	14. Domestic Cold Water Pipe	☐	32. Wall Board
☐	15. Domestic Cold Water Fitting	☐	33. Wall Insulation
☐	16. Door	☐	34. Wall Plaster/Spackle
☐	17. Drain Pipe	☐	35. Other: Duct Ceiling
☐	18. Duct Insulation		

9.2 ASBESTOS FORM CODE:

☐	1. Air cell	☐	6. Pre-formed
☐	2. Blanket	☐	7. Sheet
☐	3. Block	☐	8. Sprayed On
☐	4. Cloth	☐	9. Troweled On
☐	5. Loose fill	☐	10. Other: _____

9.3 COLOR CODE:

☐	B Blue	☐	O Orange
☐	BL Black	☐	W White
☐	BR Brown	☐	Y Yellow
☐	G Green	☐	OT Other: _____
☐	GR Gray		

10. CONSISTENCY:

☐	Brittle - hard	☐	Fibrous - loose
☐	Semi - solid	☐	Granular - pliable

N/A

11. CURRENTLY FRIABLE:
☐ Yes ☒ No

12. CURRENT MATERIAL DAMAGE:
☒ 1. No Visible Damage (U)
☐ 2. Damaged (D)
< 10% Localized or
< 25% Distributed
☐ 3. Significant Damage (S)
10% or more Localized or
25% or more Distributed

12.1 CAUSE OF DAMAGE:
☐ 1. Area Usage
☐ 2. Vibration
☐ 3. Air Flow
☐ 4. Water Damage
☐ 5. Service Activity
☐ 6. Usual Aging
☐ 7. Other: N/A

13. CONTAMINANT PRESENT:
☐ 0. None
☐ 1. Spotty
☐ 2. Widely Scattered
☐ 3. Entire Area

14. DISPERSAL FACTOR:

☐	1. Water	☐	3. Occupant
☐	2. Air	☐	4. Machinery

15. AREA USED BY:
☐ Maintenance Workers
☐ Operations Workers
☐ Administrative Personnel
☐ Visiting Public

16. POTENTIAL FOR DAMAGE:
- ☐ Low Potential for damage (L)
- ☐ Potential for damage (M)
- ☐ Potential for significant damage (H)

17.1 DISTURBANCE POTENTIAL
FREQUENCY OF CONTACT/ACCESSIBILITY:
- ☐ 0. Low/Seldom (< 1 time/month) (e.g., Area Rarely Used)
- ☐ 1. Moderate/Occasional (1-4 times/month) (e.g., Rooms/Offices)
- ☐ 2. High/Frequently (>4 times/month) (e.g., Hallways/Corridors)

17.2 DISTURBANCE POTENTIAL
INFLUENCE OF VIBRATION:
- ☐ 0. Low/None
- ☐ 1. Moderate/Noticeable (Motors, loud sounds, vibrating ducts w/o fan, etc.)
- ☐ 2. High/Extreme (Easily sensed vibration, vibrating duct w/fan, etc.)

17.3 DISTURBANCE POTENTIAL
POTENTIAL FOR AIR EROSION:
- ☐ 0. Low/None
- ☐ 1. Moderate or Noticeable Movement (Air shaft, Air stream, vent, etc.)
- ☐ 2. High/Extreme velocity (Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL
OVERALL POTENTIAL FOR DAMAGE:
- ☐ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:
- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:
- ☐ 1. ACBM in good condition w/low potential for disturbance
- ☐ 2. ACBM in good condition w/potential for damage
- ☐ 3. ACBM in good condition w/potential for significant damage
- ☐ 4. ACBM in Damaged condition w/low potential for disturbance
- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:
- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:
- ☐ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
- ☐ ≥ 3, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

25.1

Sample #	%	Asbestos Type

25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS
_____

27. COMMENTS: _____
_____
_____
_____
_____

Appendix 1

1. Inspector W.D. Lockwood Signature [signature] Accreditation # [redacted] State CO
Date _____

2. BUILDING NO.: _____
BLDG. AREA CODE: _____
- ☐ 1. 1st Floor
- ☐ 2. 2nd Floor
- ☐ 3. 3rd Floor
- ☐ 4. 4th Floor
- ☐ 5. Basement
- ☐ 6. Crawl Space
- ☐ 7. Roof
- ☐ 8. Exterior of Bldg.
- ☐ 9. Plenum
- ☐ 10. Other

3. ROOM NUMBER: _____
COLUMN NUMBERS _____

4. SPECIFIC LOCATION _____

5. % FUNCTIONAL SPACE _____

6. FUNCTIONAL SPACE I.D. _____
HOMOGENEOUS AREA I.D. _____

7. MATERIAL TYPE CATEGORY:
- ☐ T. Thermal System Insulation
- ☐ S. Surfacing Material
- ☐ M. Miscellaneous Material

8.1 TSI ACM:
PIPE LENGTH (FT) _____

8.2 TSI ACM:
PIPE DIAMETER (IN.) _____

8.3 TSI ACM:
PIPE WITH INSULATION DIAMETER (IN.)
_____

8.4 SURFACING MISC. ACM:

8.5 TOTAL SURFACE MATERIAL (SQ. FT.)
_____

8.6 SURFACING MISC ACM:
DEPTH OF SURFACE MATERIAL (IN.)
_____

9.1 FUNCTION CODE:
- ☐ 1. Acoustic Insulation
- ☐ 2. Baseboard
- ☐ 3. Boiler/Furnace Insulation
- ☐ 4. Caulking Matl
- ☐ 5. Ceiling Tile
- ☐ 6. Chilled Water Pipe
- ☐ 7. Chilled Water Pipe Fitting
- ☐ 8. Cold Water Pipe
- ☐ 9. Cold Water Pipe Fitting
- ☐ 10. Condensate Pipe
- ☐ 11. Condensate Pipe Fitting
- ☐ 12. Cooling Tower Baffles
- ☐ 13. Debris/Settled Dust
- ☐ 14. Domestic Cold Water Pipe
- ☐ 15. Domestic Cold Water Fitting
- ☐ 16. Door
- ☐ 17. Drain Pipe
- ☐ 18. Duct Insulation
- ☐ 19. Exterior Construction
- ☐ 20. Floor Tile
- ☐ 21. Fire Stop
- ☐ 22. Fireproofing Insulation
- ☐ 23. High Temp Water Pipe
- ☐ 24. High Temp Water Pipe Fitting
- ☐ 25. Mastic Adhesive
- ☐ 26. Roofing
- ☐ 27. Steam Pipe
- ☐ 28. Steam Pipe Fitting
- ☐ 29. Tank Insulation
- ☐ 30. Transite Board
- ☐ 31. Vibration Damper
- ☐ 32. Wall Board
- ☐ 33. Wall Insulation
- ☐ 34. Wall Plaster/Spackle
- ☐ 35. Other: _____

9.2 ASSESTOS FORM CODE:
- ☐ 1. Air cell
- ☐ 2. Blanket
- ☐ 3. Block
- ☐ 4. Cloth
- ☐ 5. Loose fill
- ☐ 6. Preformed
- ☐ 7. Sheet
- ☐ 8. Sprayed On
- ☐ 9. Troweled On
- ☐ 10. Other: _____

9.3 COLOR CODE:
- ☐ B Blue
- ☐ BL Black
- ☐ BR Brown
- ☐ G Green
- ☐ GR Gray
- ☐ O Orange
- ☐ W White
- ☐ Y Yellow
- ☐ OT Other: _____

10. CONSISTENCY:
- ☐ Brittle - hard
- ☐ Semi - solid
- ☐ Fibrouse - loose
- ☐ Granular - pliable

11. CURRENTLY FRIABLE:
- ☐ Yes
- ☐ No

12. CURRENT MATERIAL DAMAGE:
- ☐ 1. No Visible Damage (U)
- ☐ 2. Damaged (D)
  < 10% Localized or
  < 25% Distributed
- ☐ 3. Significant Damage (S)
  10% or more Localized or
  25% or more Distributed

12.1 CAUSE OF DAMAGE:
- ☐ 1. Area Usage
- ☐ 2. Vibration
- ☐ 3. Air Flow
- ☐ 4. Water Damage
- ☐ 5. Service Activity
- ☐ 6. Usual Aging
- ☐ 7. Other: _____

13. CONTAMINANT PRESENT:
- ☐ 0. None
- ☐ 1. Spotty
- ☐ 2. Widely Scattered
- ☐ 3. Entire Area

14. DISPERSAL FACTOR:
- ☐ 1. Water
- ☐ 2. Air
- ☐ 3. Occupant
- ☐ 4. Machinery

15. AREA USED BY:
- ☐ Maintenance Workers
- ☐ Operations Workers
- ☐ Administrative Personnel
- ☐ Visiting Public

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- ☐ Low Potential for damage (L)
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- ☐ Potential for significant damage (H)

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INFLUENCE OF VIBRATION:
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17.3 DISTURBANCE POTENTIAL
POTENTIAL FOR AIR EROSION:
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- ☐ 2. High/Extreme velocity (Air Plenum, Elevator Shaft, Fan Room, etc.)

17.4 DISTURBANCE POTENTIAL
OVERALL POTENTIAL FOR DAMAGE:
- ☐ 0. Low Potential for Damage
- ☐ 1. Potential for Damage
- ☐ 2. Potential for Significant Damage

18. PHYSICAL ASSESSMENT CATEGORY:
- ☐ 1. Damaged or Significantly Damaged TSI ACM
- ☐ 2. Damaged Friable Surfacing ACM
- ☐ 3. Significantly Damaged Friable Surfacing ACM
- ☐ 4. Damaged or Significantly Damaged Misc. ACM
- ☐ 5. ACBM with Potential for Damage
- ☐ 6. ACBM with Potential for Significant Damage
- ☐ 7. Any remaining Friable ACBM or Friable suspect ACBM

19. HAZARD POTENTIAL CLASSIFICATION:
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- ☐ 3. ACBM in good condition w/potential for significant damage
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- ☐ 5. ACBM in Damaged condition w/potential for damage
- ☐ 6. ACBM in Damaged condition w/potential for significant damage
- ☐ 7. ACBM in a Significantly Damaged condition

20. RECOMMENDED RESPONSE ACTION:
- ☐ 1. Response Action #1
- ☐ 2. Response Action #2
- ☐ 3. Response Action #3
- ☐ 4. Response Action #4
- ☐ 5. Response Action #5
- ☐ 6. Response Action #6
- ☐ 7. Response Action #7
- ☐ 8. Response Action #8

21. DAMAGED INVENTORY PRIORITY
☐ 1 ☐ 2A ☐ 2B ☐ 3

22. PLANNED ACTIVITY:
- ☐ New Activity/Use
- ☐ System Maintenance
- ☐ Required Repair
- ☐ Renovation
- ☐ Demolition

23. OTHER SYSTEMS IMPACTED:
- ☐ System Shutdown
- ☐ Backup System in Use
- ☐ No Backup/Alternate
- ☐ Routine System Maintenance

24. POTENTIAL WASTE:
- ☐ Non friable
- ☐ Regulated ACM
- ☐ Radiological Contaminated
- ☐ RCRA Contaminated

25. SAMPLING:
- ☐ ≥ 8, Non ACM, < 1000 ft.²
- ☐ ≥ 5, Non ACM, < 5,000 ft.²
- ☐ ≥ 7, Non ACM, > 5,000 ft.²
- ☐ ≥ 9, Non ACM
- ☐ 0, Assumed ACM

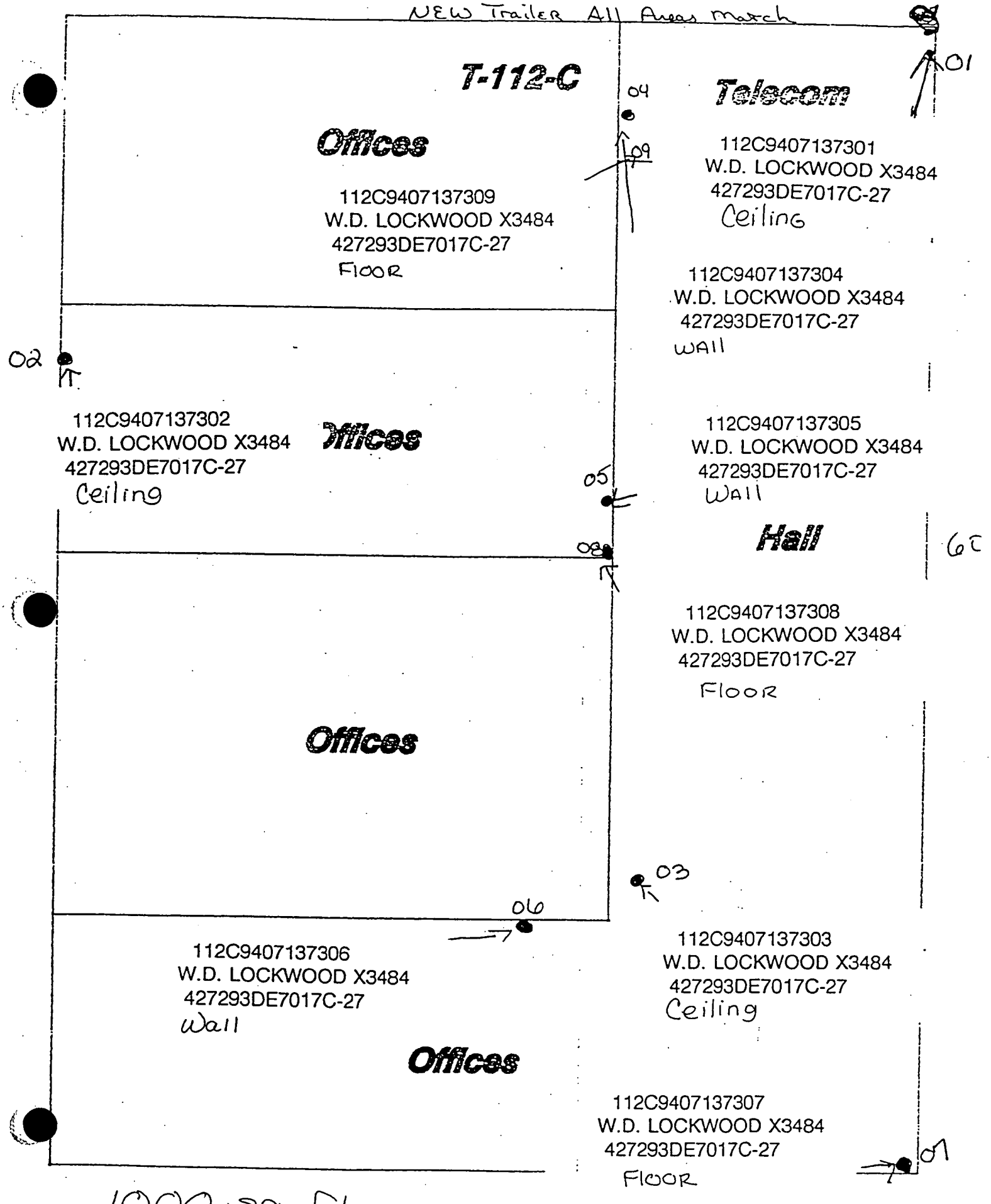
25.1

Sample #	%	Asbestos Type

25.2 LAB REPORT _____

26. WORK PACKAGE NUMBERS
_____

27. COMMENTS: _____
_____
_____
_____
_____


NEW Trailer All Areas match
T-112-C
Offices
112C9407137309
W.D. LOCKWOOD X3484
427293DE7017C-27
Floor
Telecom
112C9407137301
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling
112C9407137304
W.D. LOCKWOOD X3484
427293DE7017C-27
WALL
112C9407137302
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling
Offices
112C9407137305
W.D. LOCKWOOD X3484
427293DE7017C-27
WALL
Hall
112C9407137308
W.D. LOCKWOOD X3484
427293DE7017C-27
Floor
Offices
112C9407137306
W.D. LOCKWOOD X3484
427293DE7017C-27
Wall
112C9407137303
W.D. LOCKWOOD X3484
427293DE7017C-27
Ceiling
Offices
112C9407137307
W.D. LOCKWOOD X3484
427293DE7017C-27
Floor
01
02
03
04
05
06
08
09
1000 sq. ft.
250

Appendix 9

RLC Inspection Report for T112A

ASBESTOS INSPECTION REPORT

BUILDING T112A
PU&D YARD

September 27, 1999

Prepared for: Paul Wojtaszek
Rocky Mountain Remediation Services

Prepared by: Commodore Advanced Sciences, Inc.
143 Union Blvd., Ste. 660
Lakewood, CO 80228
RFETS: T891V; x-6508

COMMODORE
ADVANCED SCIENCES, INC.

Jen Wingard
Sampling Technician
jen.wingard@rfets.gov

RFETS, Bldg #T891V
P.O. Box 464
Golden, CO 80402-0464
Phone: (303) 966-6508
Fax: (303) 966-3308
Pager: (303) 212-3184

143 Union Blvd., Ste. 660
Lakewood, CO 80228
Phone: (303) 980-0036
Fax (303) 980-1206

252

1.0 SUMMARY

An asbestos inspection of trailer T112A was conducted by Commodore Advanced Sciences at Rocky Flats Environmental Technology Site (RFETS) on September 27, 1999. Inspection and sampling was conducted for Paul Wojtaszek to determine the trailer's asbestos quantities for demolition and future disposal in a landfill.

2.0 SCOPE

Commodore Advanced Sciences was responsible for visual inspection of specified areas to identify asbestos-containing material (ACM); bulk sampling of suspect materials and transport of samples to an accredited lab for analysis by Polarized Light Microscopy (PLM).

3.0 PROCEDURE

Inspection and sampling were performed by Jen Wingard, a licensed Asbestos Inspector certified by the State of Colorado and the Environmental Protection Agency. All work was completed per 40 CFR 763.86, 5 CCR 1000-10, RFETS Asbestos Characterization Procedure (PRO-563-ACPR), and CAS Sampling for Waste Characterization (CAS SOP-003). Michelle Hershey acted as witness and spotter as needed.

Bulk samples were delivered to CAS trailer T891R for shipment to the accredited lab Reservoirs Environmental Inc.

4.0 RESULTS

Building T112A is a five-wide trailer previously used for administrative offices and currently abandoned and located in the PU&D yard awaiting disposal. It is a wood and metal structure that contains multiple office-type rooms and two restrooms. The inside walls consisted of wood paneling with two "newer" drywall walls that had no surface coverings or taped joints. No samples were collected.

The floors consisted of carpet and tile. A different contractor previously sampled ceiling tile and floor tile on 4/21/99. Both contained no asbestos components. The tile mastic was found to contain 70% Chrysotile. On 9/27/99 CAS made the assumption that the cove base cement used in both bathrooms is also non-friable asbestos-containing material. No samples were collected.

Air ducts and waterlines were not individually insulated and had only the existing loose fiberglass insulation around them. Electrical lines and panels were also free of any potential ACM. No samples were collected.

One roof sample was collected which consisted of four layers. There was a gray putty-like material, which appeared to be used to hold the five sections of the trailer together. The actual roofing material consisted of two layers of brown resinous material on top of a very thin layer of silver paint or paper. Reservoirs Environmental Inc. which analyzed the samples found the putty to contain 15% Chrysotile, the silver paint 4% Chrysotile and the remainder free of asbestos. All materials were non-friable.

Inspection Summary Table:

Potential ACBM	Locations	Conclusion
Surfacing Material	None detected	N/A
Thermal System Insulation	None detected	N/A
Miscellaneous	Tile mastic; non-friable	70% Chrysotile; 4/21/99
	Cove base cement; non-friable	Assumed; 9/27/99
	Roofing, non-friable:	
	Putty/plaster	15% Chrysotile; 9/27/99
	Resinous material	N/A
	Silver paint	4% Chrysotile; 9/27/99

5.0 ATTACHMENTS

Chain-of-custody for sample 99Z0382-001.001 (T112A9909270101)
Analytical data from Reservoirs Environmental Services, Inc.
Asbestos Sampling Data Sheet
Asbestos Containing Material Inventory Worksheet
Field worksheet

SEP-28-1999 TUE 09:05 AM SOURCE ONE ASD FAX NO. 303 966 4555 P. 02

09/28/99 TUE 07:13 FAX 303 863 9106 RES. ENV. SERV. 002

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: RES 63457-1
Client: Kaiser-Hill Analytical Services Division
Client Project: 99Z0382, J. Wingard
Date Samples Received: September 27, 1999
Analysis Type: PLM Short Report, Bulk
Turnaround: 2 Hour

Note: The US EPA requires use of stratified analysis for NESHAP and AHERA compliance. Composite results only apply for specific exceptions.

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER: Mineral	ASBESTOS CONTENT BY LAYER: Visual Estimate (%)	Non-Asbestos Fibrous Components (%): CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
99Z0382-001	EM 435244	A	Silver paint	3	Chrysotile	4	0	0	0	0	0	0	0	96
		B	Brown resinous mateial	17		ND	0	0	0	0	0	0	0	100
		C	Gray plaster	80	Chrysotile	15	0	0	0	0	0	0	0	85

ND = None Detected CELL = Cellulose ORG = Organic WOLL = Wollastonite GYP = Gypsum Analyst: PDL
TR = Trace, < 1% Visual Estimate Trem-Act = Tremolite-Actinolite BRUC = Brucite SYNTH = Synthetic

Date: 9/28

255

RES 63457

1 of 1

SAMPLERS (Signature) jwnagel WITNESS Michelle Nero [redacted]

REPORT IDENTIFICATION NUMBER (RIN) 99Z0382 LAB/LOCATION: RESERVOIRS

RFETS CONTRACTOR CAS

ROCKY FLATS
ENVIRONMENTAL TECHNOLOGY SITE
CHAIN OF CUSTODY NUMBER 99Z0382-001

DATE	TIME	EVENT	BOTTLE	USER ID	LOCATION	CONTAINER	MATRIX	PRESERVATION: Cooled to 4°C	HNO3	H2SO4	NaOH	HCl	None	1 H202 Bottle RUSH 2 HR.
9/23/99	1336	001	001	7112890127001	ROOF	NA	SOLID						X	X

jww 9/27/99

Relinquished By:	Date	Time	Received By/Organization	Date	Time	LABORATORY USE ONLY	YES
jwnagel CAS	9/27/99	1410		9/27/99	1410	PCKG RECD/CUSTODY SEALS INTACT	jww
	9/27/99	1345		9/27/99	1345	SAMPLE LABELS/COCs AGREE	jww
						TEMPERATURE AT TIME OF RECEIPT ___ °C	

REMARKS:

Charge #

Project

256

09/28/99 TUE 07:14 FAX 303 966 8198 RES. ENV. SERV. 003

SEP-28-1999 TUE 09:05 AM SOURCE ONE ASD FAX NO. 303 966 4555 P. 03

SEP-28-1999 TUE 09:06 AM SOURCE ONE ASD FAX NO. 303 966 4555 P. 04

Kaiser-[redacted]

RFETS

CHAIN OF CUSTODY/SA[redacted]LE ANALYSIS REQUEST

C.O.C.# 99Z0382[redacted]1

Page 1 of 1

Collector	Contact/Requester CICHORZ, ROGER	Telephone No. 303-966-2155 MSN FAX
RIN 99Z0382	Sampling Origin	Purchase Order/Charge Code 15010420
Project Title	Logbook No.	Ice Chest No. Temp.
To (Lab) Reservoirs Environmental	Method of Shipment	Bill of Lading/Air Bill No.
Protocol		PRE

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☐ No ☐

Bottle No.	Customer Number	Matrix	Date	Time	Location	No/Type Container	Sample Analysis	Preservative; Packing
99Z0382-001.001	T1129092701011	IH			T112A	1-NA N/A	IH02B00[redacted] (Asbestos - bulk (PLM) off-site) [Rush]	N/A None

Relinquished By: Date/Time	Received By: Date/Time	Relinquished By: Date/Time	Received By: Date/Time
Relinquished By: Date/Time	Received By: Date/Time	Relinquished By: Date/Time	Received By: Date/Time
Relinquished By: Date/Time	Received By: Date/Time	Relinquished By: Date/Time	Received By: Date/Time
Relinquished By: Date/Time	Received By: Date/Time	Relinquished By: Date/Time	Received By: Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By: — Date/Time

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Asbestos Containing Material Inventory Worksheet

Building Number T112A Room Number NA Date 9/27/99

Pipe insulation:

Type: NO ACM; FIBERGLASS ONLY Linear/sq. ft.____ Fitting count:____

Type: ____ Linear/sq. ft.____ Fitting count:____

Type: ____ Linear/sq. ft.____ Fitting count:____

Type: ____ Linear/sq. ft.____ Fitting count:____

Duct insulation:

Type: NO ACM; FIBERGLASS ONLY Duct Size/app. ____ Sq. ft.____

Type: ____ Duct Size/app. ____ Sq. ft.____

Type: ____ Duct Size/app. ____ Sq. ft.____

Type: ____ Duct Size/app. ____ Sq. ft.____

Other:____

____

SURFACE INVENTORY:

Location: NO ACM Description: ____ Sq. ft. ____

Location: ____ Description: ____ Sq. ft. ____

Location: ____ Description: ____ Sq. ft. ____

Location: ____ Description: ____ Sq. ft. ____

MISCELLANEOUS INVENTORY:

Location: Bathrooms Description: Coveabase cement Sq. ft. ____

Location: FloorTile Description: Tile mastic Sq. ft. ____

Location: Roof Description: Gray putty-like cement Sq. ft. ____

Location: Roof Description: Silver paint/paper Sq. ft. ____

PREPARED BY JEN WINGARD DATE 9/27/99

SIGNATURE jen wingard

FIELD

ASI SAMPLE REQUEST WORKSHEET

RIN: 99E0382
EVENT: 001
DUPLICATE ID: NA
ISSUE DATE: 092799

WASTE STREAM ID: NA
CUSTOMER SAMPLE ID:
FIELD BLANK ID:
EQUIPMENT BLANK ID:
TRIP BLANK:

Comments/Problems encountered during sampling: We sampled on the roof between sections at point "F12" labeled in tape. JW Sampled; MH witnessed.
NO SAP required per customer; no airpump required per MH.

Location Description: TRAILER 112A LOCATED IN PUDD YARD. ROOF SITE "F12"

Other ID: T112799092701 01

Sample Appearance: grey clay-like material with silver paper on brown material on black material.

Sampling Device: chisel, metal

Sample Date: 9/27/99 Sample Time: 1338 Rad Screen Sample Date: NA

Was generator notified to receive excess sample? (Yes) ✓ (No)

Sampler's Signature: jwingard Michelle Hershey SAMPLE WITNESS ONLY.

Employee Numbe [redacted] [redacted]

Date: 9/27/99 9/27/99

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Asbestos Sampling Data Sheet

Job # 9920382 Name JEN WINGARD Date 9/27/99

General Description of building/area: BLDG T112A IN PW&D YARD (TRAILER)

Sample Number	Sample Description and Location
T112A990927-0101	ROOFING MATERIALS: GRAY PUTTY FROM BETWEEN TRAILER SECTIONS; ROOF RESINOUS COMPOSITE 2 BROWN LAYERS WITH SILVER PAINT OR PAPER FIRMLY ATTACHED.

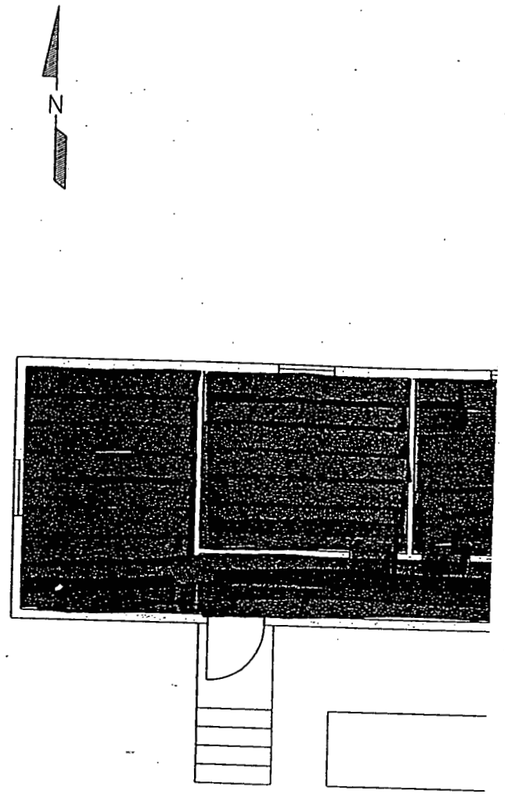
JEN 9/27/99

PREPARED BY JEN WINGARD DATE 9/27/99

SIGNATURE Jen Wingard

260/260

ROCKY FLATS ENVIRONMENTA
TECHNOLOGY SITE
T-112C



HOMOGENEOUS LEGEND

Ceiling

Floor

Wall